152 US 100

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RECORD, CASE No. 14,244.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1893.

TERM No., 235.

THE BELDEN MANUFACTURING COMPANY, APPELLANT,

vs.

THE CHALLENGE CORN PLANTER COMPANY.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE WESTERN DISTRICT OF MICHIGAN.

FILED OCTOBER 11, 1890.

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1 *Chancery Subpœna.*

THE UNITED STATES OF AMERICA, *Western District of Michigan, Southern Division,* } ss:

The President of the United States of America to The Challenge Corn Planter Company, defendant, Greeting:

We command you and every of you that you appear before our judges of our circuit court of the United States of America for the western district of Michigan, at Grand Rapids, in said district, on the first Monday in the month of April next, to answer the bill of complaint of The Belding Manufacturing Company, complainant, this day filed in the clerk's office of said court, in said city of Grand Rapids, then and there to receive and abide by such judgment and decree as shall then or thereafter be made upon pain of judgment being pronounced against you by default.

To the marshal of the western district of Michigan to execute.

Witness the Hon. Melville W. Fuller, Chief Justice of [SEAL.] the Supreme Court of the United States of America, at Grand Rapids aforesaid, this eleventh day of March, in the year of our Lord one thousand eight hundred and eighty-nine.

CHARLES L. FITCH, *Clerk,*
By —— ——, *Deputy.*

MEMORANDUM.—The within-named defendant is notified that unless it enters its appearance in the clerk's office of said court, at Grand Rapids aforesaid, on or before the day to which the within writ is returnable, the bill of complaint will be taken against it as confessed and a decree entered accordingly.

CHARLES L. FITCH, *Clerk,*
By —— ——, *Deputy.*

2 [Endorsed:] No. 963. Circuit court of the United States, western district of Michigan, southern division. The Belding Manufacturing Company, complainant, *vs.* Challenge Corn Planter Company, defendant. Chancery subpœna. Returnable to rule day first Monday in April, A. D. 1889. Filed March 12, A. D. 1889. C. L. Fitch, clerk. Poole & Brown, compl't's sol'r-, 225 Dearborn St., Chicago, Ill.

To the marshal:

The marshal will serve this subpœna and notice for a writ of injunction personally upon each of the defendants, or in case any of them cannot be found, then serve on such by leaving a copy thereof at the dwelling-house or usual place of abode of such defendant, with some adult person, who is a member or resident of the family, of suitable age and discretion.

——— ———,
Compl't's Sol'r.

WESTERN DISTRICT OF MICHIGAN, *ss:*

I hereby certify and return that on the eleventh day of March, A. D. 1889, I served the within writ on The Challenge Corn Planter Company, the defendant within named, at Grand Haven, in said district, by delivering a copy of this writ, with seal endorsed as hereon impressed, to M. C. Sheldon, president of said company, at the office of said company, and by showing him this writ and seal.

D. R. WATERS,
U. S. Marshal,
By —— ——, *Deputy.*

Fee paid, $5.50.

3 United States Circuit Court, Western District of Michigan, Southern Division.

BELDING MANUFACTURING CO.
vs.
CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

Bond for Costs.

I, F. E. Ranney, a resident of Belding, county of Ionia and State of Michigan, do hereby acknowledge myself security for all proper costs and charges for which the plaintiff may become liable in the above-named suit.

Given at Belding this 13th day of March, 1889.

F. E. RANNEY.

UNITED STATES OF AMERICA,
Western District of Michigan, } *ss:*

Fred. E. Ranney, the above-named surety, being by me first duly sworn, deposes and says that he is worth at least ten thousand dollars in property within said district and subject to sale on execution, over and above all liabilities and exemptions.

FRED. E. RANNEY.

Subscribed and sworn to before me this 6th day of April, A. D. 1889.

CHARLES L. FITCH, *Clerk.*

4 [Endorsed:] No. 963. The circuit court of the United States for the western district of Michigan, southern division. In equity. Belding M'f'g Co. *vs.* Challenge Corn Planter Co. Security for costs. Filed Mar. 14, 1889. C. L. Fitch, clerk.

5 Law offices of Arthur Stem, 216 Main St., Cincinnati, O.

Patent cases.

CINCINNATI, *March 12th*, 1889.

Clerk of U. S. court, Grand Rapids, Mich.

DEAR SIR: I am just in receipt of a telegram from Mr. Levi Scofield, dated Grand Rapids, stating that a suit had been begun against the Challenge Corn Planter Co. for infringement of a refrigerator patent. I presume Mr. Scofield has seen you and procured copies of the complainant's bill and affidavits and will send them to me; if he has not procured copies, please send copies to me with as little delay as possible. Of course, if he has procured copies you need not send any to me, as he will send them himself.

Please enter my appearance for the defendant.

Yours truly, ARTHUR STEM.

(Dictated.)

6 [Endorsed:] No. 963. The circuit court of the United States for the western district of Michigan, southern division. In equity. Belding M'f'g Co. *vs.* Challenge Corn Planter Co. Præcipe for def't's appearance. Filed Mar. 14, 1889. C. L. Fitch, clerk. Arthur Stem, def't's sol'r.

7 The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity. March Term, A. D. 1889.

THE BELDING MANUFACTURING COMPANY, Complainant, *vs.* THE CHALLENGE CORN PLANTER COMPANY, Defendant. } Entered March 14, 1889.

In this cause, on motion of Arthur Stem, solicitor for said defendant, it is ordered that the appearance of said defendant be, and the same hereby is, entered in this cause.

ARTHUR STEM,
Def't's Sol'r.

8 UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING CO., Complainant, *vs.* THE CHALLENGE CORN PLANTER CO., Defendant.

Mess. Taggart & Denison & Arthur Stem:

GENTLEMEN: Please take notice that we have been retained as resident counsel for the complainant in the above-entitled cause, and that we will accept service of all papers and pleadings in said cause;

also that we desire to be present at the justification of the bond directed to be executed by and in behalf of the defendant in said cause.

Yours truly,

McGARRY & FORD,
Of Counsel for Complainant.

9 [Endorsed:] No. 963. United States court. Belding Man'f'g Co., complainant, *vs.* The Challenge Corn Planter Co., defendant. Notice of retainer. Filed Apr. 4, 1889. C. L. Fitch, clerk. McGarry & Ford, of counsel for complainant.

10 In the United States Circuit Court for the Southern Division of the Western District of Michigan.

BELDING MANUFACTURING COMPANY
vs.
CHALLENGE CORN PLANTER COMPANY. } In Equity. No. 963.

Stipulation.

It is hereby stipulated by and between the counsel for the respective parties to the above-entitled cause that the complainant shall close its *prima facie* proofs by June 1st, 1889; that the defendant shall have until Sept. 1st to take its proofs, and that complainant shall then have until Oct. 1st to take rebuttal testimony.

Signed at Chicago, Ill., this 10th day of April, A. D. 1889.

POOLE & BROWN,
Solicitors for Complainant.

Signed at Cincinnati, Ohio, this 12 day of April, A. D. 1889.

ARTHUR STEM,
Solicitors for Defendant.

11 [Endorsed:] Gen'l No., 963. Term No., —. In the United States circuit court for the southern division of the western district of Michigan. Belding Man'f'g Co. *vs.* Challenge Corn Planter Company. In equity. No. 963. Stipulation dividing time to take testimony. Filed Apr. 17, 1889. C. L. Fitch, clerk. Poole & Brown, attorneys and counselors in patent causes, Temple court, Chicago, Ill., 225 Dearborn street.

12 In the United States Circuit Court, Western Division, Southern District of Mich.

THE BELDING MANUFACTURING CO.
vs.
THE CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

Stipulation.

It is hereby stipulated by and between counsel for the respective parties to the above-entitled cause that the time for taking testimony herein be, and the same is hereby, extended as follows:

Complainants to close *prima facie* proofs June 22nd, 1889.
Defendants to close answering testimony September 1st, 1889.
Complainants to close rebuttal proofs October 1st, 1889.
Signed at Chicago May 21st, 1889.

POOLE & BROWN,
Solicitors for Complainants.

Signed at Cincinnati, Ohio, May 22, 1889.

ARTHUR STEM,
Solicitor for Defendant.

13 [Endorsed:] No. 963. U. S. circuit court, west. div., south. dist. of Mich. In equity. Belding Manf. Co., comp't, *vs.* Challenge Corn Planter Co., def't. Stipulation extending time to take proofs. Filed May 24, 1889. C. L. Fitch, clerk.

14 United States Circuit Court, Western District of Michigan, Southern Division.

THE BELDING MANUFACTURING COMPANY
vs.
CHALLENGE CORN PLANTER COMPANY. } In Equity.

Amendment to Answer.

Now comes the defendant herein, and by leave of court first had and obtained amends its answer *nunc pro tunc* by inserting after the thirteenth section thereof the following:

It says, upon information and belief, that the alleged invention or every material or substantial part thereof had been patented long prior to his supposed invention or discovery thereof, and shown, described, and patented in letter-patent of the United States No. 103,336, granted Francis W. Hunt May 24th, 1870.

ARTHUR STEM,
Sol'r for Def't.

15 [Endorsed:] No. 963. The circuit court of the United States for the western district of Michigan, southern division. In equity. Belding M'f'g Co. *vs.* Challenge Corn Planter Co. Amendment of answer. Filed Sep. 6, 1889. C. L. Fitch, clerk.

16 United States Circuit Court, Western District of Michigan, Southern Division.

THE BELDING MANUFACTURING COMPANY
vs.
CHALLENGE CORN PLANTER COMPANY. } In Equity.

Amendment to Answer.

Now comes the defendant herein, and by leave of court first had and obtained amends its answer *nunc pro tunc* by inserting after the thirteenth section thereof the following:

It says, upon information and belief, that the alleged invention

or every material or substantial part thereof had been patented long prior to his supposed invention or discovery thereof, and shown, described, and patented in letters patent of the United States No. 103,336, granted Francis W. Hunt May 24th, 1870.

We have no objection to the filing of this amendment to defendant's answer.

Chicago, Sept. 6, '89.

POOLE & BROWN,
Sol'rs for Compl't.

17 [Endorsed:] No. 963. The circuit court of the United States for the western district of Michigan, southern division. In equity. Belding M'f'g Co. *vs.* Challenge Corn Planter Co. Amendment of answer and consent thereto. Filed Sep. 10, 1889. C. L. Fitch, clerk.

18 United States Circuit Court, Western District of Michigan, Southern Division.

THE BELDING MANUFACTURING CO. *vs.* THE CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

Stipulation.

It is hereby stipulated by and between counsel for the respective parties hereto that the time for taking defendant's testimony be, and the same is hereby, extended so as to expire on the first day of December, A. D. 1889, and that the time for taking the cross-examination of the witness Dayton, on behalf of complainant, and the time for taking complainant's rebuttal proofs be, and the same is hereby, extended so as to expire on the first day of February, A. D. 1890.

Signed at Chicago, Ill., this 28th day of September, A. D. 1889.

POOLE & BROWN,
Solicitors for Complainant.

Signed at Grand Rapids, Mich., this 30 day of September, A. D. 1889.

TAGGART & DENISON,
Solicitors for Defendant.

19 [Endorsed:] No. 963. The circuit court of the United States for the western district of Michigan, southern division. In equity. Belding M'f'g Co. *vs.* Challenge Corn Planter Co. Stipulation to extend time to take testimony. Filed Sep. 30, 1889. C. L. Fitch, clerk.

20 At a session of the circuit court of the United States for the sixth circuit and western district of Michigan, southern division, begun and held at the United States court-rooms, in the city of Grand Rapids, in said district, on the first day of October, in the year of our Lord one thousand eight hundred and eighty-

nine, and of the Independence of the United States of America the one hundred and fourteenth.

Present: The Honorable Henry F. Severens, district judge.

THE BELDING MANUFACTURING COMPANY, Complainant,
vs.
THE CHALLENGE CORN PLANTER COMPANY, Defendant. } No. 963.

On reading the stipulation of the parties in this cause, signed by their respective solicitors, on file in this cause, it is ordered that the time for taking defendant's testimony in this cause be, and the same hereby is, extended so as to expire on the first day of December, A. D. 1889, and that the time for taking the cross-examination of the witness Dayton and the time for taking complainant's proofs in rebuttal be, and the same hereby is, extended so as to expire on the first day of February, A. D. 1890.

21 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

Your petitioner, The Challenge Corn Planter Company, defendant herein, represents that the testimony in the above-entitled case will be voluminous; that the same is being taken under stipulations between the parties hereto; that the complainant has closed its *prima facie* case, and that the defendant has taken substantially all the testimony which it desires to take in defence thereof; that the complainant has now given notice of taking its rebutting proofs; that Messrs. Poole & Brown are the solicitors for the complainant; that they reside in the city of Chicago, and that they have already printed the testimony which has been taken by them so far in the case; that it has been mutually understood between the solicitors for the complainant and defendant that the testimony would be printed, and that one of the complainant's solicitors, Mr. Brown, requested that the defendant proceed and have its testimony printed so that they might have a copy of the same at as early a date as possible.

Your petitioner therefore requests the court to make an order under the special rule in such cases made and provided, requiring the parties to print the pleadings and testimony in accord-
22 ance with the said rule; and your petitioner will ever pray.

CHALLENGE CORN PLANTER COMPANY,
By EDWARD TAGGART,
Its Attorney-in-Fact.

STATE OF MICHIGAN, } ss:
County of Kent, }

Edward Taggart, being duly sworn, says that he is a member of the firm of Taggart & Denison; that said firm of Taggart & Denison are the solicitors for the defendant in the above-entitled cause; that he signed said petition and was duly authorized so to do; that he has read the same, and that the same is true in substance and in fact.

EDWARD TAGGART.

Subscribed and sworn to before me this 23d day of January, 1890.

HUGH E. WILSON,
Notary Public, Kent Co., Mich.

23 [Endorsed:] No. 963. U. S. circuit court for the west. dist. of Mich., so. div. In equity. Belding M'f'g Co., complainant, *vs.* Challenge Corn Planter Co., defendant. Petition. Filed Jan. 23, 1890. C. L. Fitch, clerk. Taggart & Denison, sol'rs for defendant.

24 October Term, A. D. 1889.

THURSDAY, *January* 23, 1890.

The court met pursuant to adjournment.
Present: The Honorable Henry F. Severens, district judge.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant. } No. 963.

Upon reading and filing the petition of the said defendant and on motion of Taggart & Denison, of counsel for said defendant, it is ordered that the pleadings and proofs in this case or the material portion thereof be printed by the respective parties pursuant to the provisions of rule No. 19 of this court in equity.

25 March Term, A. D. 1890.

TUESDAY, *June* 24, 1890.

The court met pursuant to adjournment.
Present: The Honorable Henry F. Severens, district judge.

THE BELDING MANUFACTURING COMPANY
vs.
THE CHALLENGE CORN PLANTER COMPANY } Bill

and and No. 963.

THE CHALLENGE CORN PLANTER COMPANY
vs.
THE BELDING MANUFACTURING COMPANY. } Cross-bill.

This cause having been set down for final hearing upon pleadings and proofs at this day, now comes the said Challenge Corn

Planter Company, by Arthur Stem and Taggart & Denison, its solicitors, and by consent in open court of Messrs. Poole & Brown, solicitors for said Belding Manufacturing Company, dismisses its cross-bill of complaint in this cause.

And thereupon the court listened to the arguments in part of counsel for the respective parties upon the main bill of complaint in this cause.

26 March Term, A. D. 1890.

WEDNESDAY, *June* 25, 1890.

The court met pursuant to adjournment.

Present: The Honorable Henry F. Severens, district judge.

THE BELDING MANUFACTURING COMPANY
vs.
THE CHALLENGE CORN PLANTER COMPANY. } No. 963.

In this cause the court listened to the conclusion of the arguments of counsel for the respective parties, and thereupon it is ordered, adjudged, and decreed that letters patent of the United States No. 204,216, granted on the 28th day of May, A. D. 1878, to R. T. Hambrook, to restrain an alleged infringement upon which the bill of complaint in this cause was filed, contain and set forth no patentable invention in view of preceding inventions and the prior state of the art, and that said letters patent No. 204,216 are and were therefore invalid, and that the said complainant's bill of complaint herein be, and the same hereby is, dismissed.

And it is further ordered and adjudged that the defendant in this cause do recover against the said complainant its costs and charges in this cause, to be taxed.

But, it appearing to the court that the cross-bill filed in this cause was unnecessary to the relief sought therein, it is further ordered that the said complainant do recover against the said defendant its costs and charges upon said cross-bill, to be taxed, the same to be deducted from the costs taxed upon the main bill in favor of said defendant as aforesaid, and that for the residue of said costs so to be taxed in favor of said defendant as aforesaid said defendant have execution against said complainant.

27 And thereupon, the said complainant praying in open court an appeal from said decree, the said appeal is hereby allowed and the bond upon said appeal is hereby fixed at the sum of one thousand dollars ($1,000), such bond, when duly approved and filed, to operate as a supersedeas.

THE BELDING MANUFACTURING COMPANY
vs.
THE CHALLENGE CORN PLANTER COMPANY. } No. 963.

In this cause, on application of Messrs. Poole & Brown, solicitors for said complainant, it is ordered that all depositions heretofore received herein be, and the same hereby are, opened.

28 The Circuit Court of the United States for the Western District of Michigan, Southern Division.

THE BELDING MANUFACTURING COMPANY, Complainant,
vs.
THE CHALLENGE CORN PLANTER COMPANY, Defendant,
} Bill

and

THE CHALLENGE CORN PLANTER COMPANY, Complainant,
vs.
THE BELDING MANUFACTURING COMPANY, Defendant.
} Cross-bill.

and

In this case I am of the opinion that, in view of former inventions and the state of the art in reference to the construction of refrigerators at the date of the Hambrook patent, there was no patentable invention in it. There are some features in it that seem like improvements in construction, but there is no new device in it worthy to be called invention. Among others, the Smith patent of 1877, reissued in 1878, covered all the essential features of Hambrook's construction, and defendant's refrigerator bears quite as close a similitude to the former as to the latter. The bill must be dismissed with costs.

More mature reflection leads me to the conclusion that proper practice in the allowance of an injunction to the defendant, such as was allowed in the present case, pending the suit is to consider the application upon petition in the main case, and that a cross-bill is not necessary. Costs will, therefore, be allowed complainant upon the dismissal of the cross-bill, and they may be deducted from the defendant's costs and execution allowed for the balance.

H. F. SEVERENS, *Dist. Judge.*

29 [Endorsed:] No. 963. The circuit court of the United States for the western district of Michigan, southern division. In equity. Belding Manufacturing Company *vs.* Challenge Corn Planter Company. Opinion. Filed Jun- 25, 1890. C. L. Fitch, clerk.

30 In the United States Circuit Court for the Western District of Michigan, Southern Division.

BELDING M'F'G CO., Complainant, Appellant,
vs.
CHALLENGE CORN PLANTER CO., Defendant, Appellee.
} In Equity. No. 963.

Stipulation.

Upon the solicitation of counsel for complainant and in order to reduce the cost of certifying the record herein to the Supreme Court of the United States it is hereby stipulated by and between the counsel for the respective parties to the above-entitled cause:

I. That the clerk shall not certify to the Supreme Court the petition of the Challenge Corn Planter Co. for an injunction, the cross-bill of said company and pleadings thereto, the affidavits filed by the respective parties upon the hearing of the motion for an injunction, nor any of the orders of court thereon of April 2nd, 1889, or thereafter, nor any of the letter exhibits introduced by the defendants, The Challenge Corn Planter Co., either in support of said motion for an injunction or referred to on page 157 of defendants' printed record.

II. It is further agreed by and between counsel that in certifying all other documentary exhibits, such as catalogues, copies of letters patent, complainant's title papers, etc., the clerk (with the approval of the court) may use the said original exhibits as filed and certify to the same without making copies thereof, and in the event that the court shall not approve of the certifying of the said original exhibits it is agreed that the complainant, The Belding M'f'g Co.,
31 may furnish the clerk with duplicate printed copies of said exhibits if the said duplicates can be produced, and that the clerk may use and certify to such duplicate copies instead of preparing duplicate copies.

III. It is further stipulated by and between counsel that the clerk may use the printed copies of the pleadings and records filed herein so far as he can.

IV. It is further stipulated that all refrigerators or parts thereof introduced as exhibits may be returned to the custody of the party introducing the same, and that complainant's exhibits will be deposited in the custody of the clerk of the supreme court at least ten (10) days before the date fixed for the hearing of this cause on appeal, and that none of the refrigerators offered in evidence by the defendant need be sent to the supreme court, except the Hambrook refrigerator, marked "Defendant's Exhibit the R. T. Hambrook Refrigerator."

Signed at Chicago, Illinois, this 4th day of August, A. D. 1890.

POOLE & BROWN,
Solicitors for Complainant.

Signed at Grand Rapids, Michigan, this 5th day of August, A. D. 1890.

TAGGART & DENISON,
Solicitors for Defendant.

Approval is hereby given to the use by the clerk of the original exhibits on file in this cause in making his return to the supreme court upon the complainant's appeal.

Dated Aug. 15, 1890.

H. F. SEVERENS, *Judge.*

32 [Endorsed:] Gen'l No., 963. Term No., —. In the United States circuit court for the southern division of the western district of Michigan. Belding Man'f'g Co. *vs.* Challenge Corn Planter Company. In equity. 963. Stipulation. Filed Aug. 9,

1890. C. L. Fitch, clerk. Poole & Brown, attorneys and counselors in patent causes, Owings building, Chicago, Ill., 215 Dearborn street.

33 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

Defendant's Bill of Costs.

Docket fee by statute		20 00
Solicitor's fee for 10 depositions, at $2.50		7 50
Seven depositions struck out because in both cases.		
Notary's fees for depositions:		
Paul F. Coste, St. Louis	16 95	
Gertrude Anderson, Detroit	8 25	
Lizzie Clark, Chicago	4 50	
One-half of Wilson's fees taxed. See affidavit of Edward Taggart.		
Hugh E. Wilson, Grand Rapids	46 40	
		76 10
P'd for 17 copies patents in evidence		1 70
" file-wrapper and contents in evidence		4 90
" 3 Patent Office models in evidence		21 90
60 pp. (one-half of pp. 49 to 169) struck out. See affidavit of Mr. Taggart.		
P'd for printing record, 164 pp., at 90c		93 60
" express and freight charges on exhibits in evidence to Grand Rapids		
Simmons' refrigerator, from St. Louis		
Buhl refrigerator, from Detroit		
Spear refrigerator, from Chicago		
		224 80
Freight and express charges disallowed.		

34

	224 80
Hambrook refrigerator, from Chicago	
Clerk's fees (entire balance unpaid) paid by complainant.	
Marshal's fees and clerk's fees at Chicago, issuing and serving subpœna on Spear	2 50
Marshal's fees serving subpœna on Hotchkiss	60

Witness fees as follows:

Albert A. Spear, of Chicago, travel 1 mile to Chicago and return same distance and 1 day's attendance	1 60	
Charles H. Jacobs, of Detroit, travel 1 mile to Detroit and return same distance and 1 day's attendance	1 60	
James E. Smith, of St. Louis, travel 1 mile to St. Louis and return same distance and 1 day's attendance	1 60	
Levi Scofield, of Grand Haven, Mich., travel 32 miles to Grand Rapids and return same distance and 1 day's attendance	4 70	
A. W. Ranney, of Kalamazoo, Mich., travel 48 miles to Grand Rapids and return same distance and 1 day's attendance	6 30	
S. M. Brown, of Belding, Mich., travel 48 miles to Grand Rapids and return same distance and 1 day's attendance	6 30	
A. J. Gardner, of Belding, Mich., travel 48 miles to Grand Rapids and return same distance and 1 day's attendance	6 30	
George R. Hotchkiss, of Chicago, travel 118 miles from district line to Grand Rapids and return same distance and 2 days' attendance	14 80	
John C. Martin, of Eau Claire, Wis., travel 118 miles to Grand Rapids and return same distance and 1 day's attendance	13 30	
James W. See, of Hamilton, O., travel 100 miles and more to Grand Rapids and return same distance and 2 days' attend.	13 00	
	69 50	69 50
		$297 40

WESTERN DISTRICT OF MICHIGAN, *ss:*

By direction of the court I hereby retax this bill of costs in favor of defendant and against complainant at the sum of three hundred six & $\frac{15}{100}$ dollars.

Dated Aug. 26, 1890.

CHARLES L. FITCH, *Clerk.*

WESTERN DISTRICT OF MICHIGAN, *ss:*

I hereby tax the foregoing bill of costs in favor of defendant and against complainant at the sum of two hundred ninety-seven & $\frac{40}{100}$ dollars.

Dated Aug. 16, 1890.

CHARLES L. FITCH, *Clerk.*

35 UNITED STATES OF AMERICA, *Western District of Michigan,* } ss:

Arthur C. Denison, one of defendant's solicitors, being duly sworn, says that the foregoing items of costs charged as disbursements have actually been paid and were necessary and are reasonable in amounts; that the witnesses above named were in good faith made to attend and were deemed material and necessary, and they respectively travelled the number of miles and actually attended the number of days specified, and that the copies, exhibits, and exemplifications charged for were actually and necessarily used or necessarily and in good faith obtained for use.

ARTHUR C. DENISON.

Sworn to and subscribed before me this 2nd day of August, 1890.

HUGH E. WILSON,
Notary Public, Kent County, Michigan.

STATE OF MICHIGAN, *County of Kent,* } ss:

Edward Taggart, of said county, being duly sworn, says that he is one of the solicitors for the defendant in the cause entitled in the annexed bill of costs, and had charge of the taking of defendant's evidence therein and is familiar with such evidence; that the testimony contained on pages 49 to 169 of the printed Record and entitled both in the original bill and the cross-bill all was taken in and used in the original case, and all was material and pertinent to the issues under the original bill; that a portion of such testimony, and, as nearly as affiant can estimate, about one-half thereof, was also pertinent to the issues under the cross-bill, but was not used upon any hearing under said cross-bill.

EDWARD TAGGART.

Subscribed and sworn to before me this 2nd day of August, 1890.

HUGH E. WILSON,
Notary Public, Kent County, Michigan.

36 UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Compl't,
vs.
CHALLENG- CORN PLANTER COMPANY, Def't.

COUNTY OF KENT, ss:

Eber Rice, being duly sworn, says that he is manager of the West Michigan Printing Company, and printed the record in said cause; that he agreed, before commencing the work, with the defendant to charge 90 cents a page therefor; that he made such charge accordingly, being 170 pages at 90 cents, amounting to $153,

and that the same, viz., $153, has been paid to said printing Co. in full and without any agreement for any rebate.

Affiant further says that he is generally familiar with legal printing in different localities; that one dollar per page is a common, and affiant believes the most common, price for record work; that the record as printed by affiant's firm in this case contains considerably more matter on a page than is usual in record work in this city, and ninety cents a page is a reasonable price therefor.

That in the city of Grand Rapids prices for such work, owing to great competition, are lower than in any other place affiant knows of, and considerable of such work is done by printers who do their own typesetting, at the bare cost of typesetting, press-work, and paper, and that owing to such competition affiant has frequently, in order to keep his men at work when business was dull, done such work at a very small profit or none at all, and at a less price than he charged defendant.

Affiant further says that his arrangement for said printing was made entirely with the defendant and not with its attorneys;
37 that affiant's firm does annually a large amount of business for defendant, probably all of its printing; that this record was brought to him when his office had plenty of other work, and was wanted in a hurry, as the hearing was expected soon, and in view of these facts affiant did not think it necessary to make the lowest price in order to get the job.

That affiant did put a large force on this work and rush the record through in such a manner that he would have been justified in charging 15 or 20 cents per page above the market price on this account alone, quite a part of the work being done at night, for which work compositors receive one and one-half pay.

EBER RICE.

Subscribed and sworn to before me this 9th day of July, 1890.

HUGH E. WILSON,
Notary Public, Kent Co., Mich.

To Messrs. Poole & Brown, solicitors for complainant:

Take notice that the foregoing is a copy of the defendant's bill of costs, proposed to be taxed, and of the affidavits to be read in support thereof, and that application will be made to the clerk of said court to tax the same, at his office, on the 6th day of August, A. D. 1890, at 10 o'clock a. m.

TAGGART & DENISON,
Solicitors for Defendant.

Dated this 2nd day of August, 1890.

37½ [Endorsed:] No. 963. Circuit court for west. dist. of Mich., so. div. In equity. Belding M'f'g Co., complainant, *vs.* Challenge Corn Planter Co., defendant. Bill of costs. Filed Aug. 16, 1890. C. L. Fitch, clerk. Taggart & Denison, defendant's solicitors.

38 United States Circuit Court, Western District of Michigan, Southern Division.

BELDING M'F'G CO.
vs.
CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

STATE OF ILLINOIS, }
County of Cook, } ss:

Taylor E. Brown, being duly sworn, deposes and says that he is of lawful age and one of the solicitors for the complainant in the above-entitled cause; that some time betweenthe 4th day of July, 1890, and the 9th day of July, 1890, Arthur Stem, Esq., one of the solicitors for the defendant in the above-entitled cause, called at affiant's office, in the Owings building, Chicago, Illinois, and had conversation with affiant regarding the controversy between the complainant and defendant and particularly with regard to the dismissal of the suits brought by complainant, The Belding Manufacturing Company, against the customers of the complainant company, and that during said interview affiant called the attention of the said Arthur Stem to the outrageously large cost bill which Messrs. Taggart & Denison, also solicitors for defendant, proposed to tax before the clerk of court, and particularly to the item of $56.70 for printing defendant's brief. Mr. Stem on that occasion, to wit, between the 4th and 9th days of July, 1890, told affiant in his said office that it was not customary to tax the printing of briefs; that he did not know of any rule to sanction it; that it was wrong, and that Taggart & Denison should not have inserted any such item in defendant's cost bill.

Affiant states that he knows of no precedent for such practice, and that the rule of court permitting the taxation for printing the records does not include and never was intended to include
39 the printing of briefs; and, furthermore, in this particular case, the defendant's brief was not filed with the clerk of court at or before the hearing of said cause nor was it handed in person to his honor Judge Severns at the hearing and before the order dismissing the bill was entered, and that in any event, in his opinion, the clerk cannot properly tax a paper not of record in the cause; and further affiant saith not.

TAYLOR E. BROWN.

Subscribed and sworn to before me this 21st day of July, A. D. 1890.

[NOTARIAL SEAL.] C. CLARENCE POOLE,
Notary Public.

United States Circuit Court, Western District of Michigan, Southern Division.

BELDING M'F'G CO.
vs.
CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

STATE OF MICHIGAN, }
County of Kent, } *ss:*

Harvey O. Carr, being duly sworn, deposes and says that he resides in the city of Grand Rapids, county of Kent, and State of Michigan; that he is foreman of "The Democrat" job-rooms, Grand Rapids; that he is and has been acquainted with the price and value of printing records for use in the circuit court of the United States for the western district of Michigan, southern division, and the supreme court of the State of Michigan; that he has been shown a printed copy of the defendant's proof in this cause; that the price per page for such printing ranges from 50 cents to 65 cents and does not exceed 65 cents; that according to the best knowledge and belief of this deponent 60 cents is a fair and reasonable compensation per page for printing the defendant's proof in the above-entitled cause.

HARVEY O. CARR.

Subscribed and sworn to before me this 24th day of July, A. D. 1890.

CHARLES A. FRENCH,
Notary Public, Kent Co., Mich.

40 United States Circuit Court, Western District of Michigan, Southern Division.

BELDING M'F'G CO.
vs.
CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

STATE OF MICHIGAN, }
County of Kent, } *ss:*

Isaac S. Dygert, being duly sworn, deposes and says that he resides in the city of Grand Rapids, county of Kent, and State of Michigan; that he is a job printer; that he is and has been acquainted with the price and value of printing records for use in the circuit court of the United States for the western district of Michigan, southern division, and the supreme court of the State of Michigan; that he has been shown a printed copy of the defendant's proof in this cause; that the price per page for such printing ranges from 50 cents to 65 cents and does not exceed 65 cents; that according to the best knowledge and belief of this deponent 60 cents is a fair and reasonable compensation per page for printing the defendant's proof in the above-entitled cause.

ISAAC S. DYGERT.

Subscribed and sworn to before me this 24th day of July, A. D. 1890.

TESSA DUNCAN,
Notary Public, Kent Co., Mich.

United States Circuit Court, Western District of Michigan, Southern Division.

BELDING M'F'G CO.
vs.
CHALLENGE CORN PLANTER CO. } In Equity. No. 963.

STATE OF MICHIGAN, }
County of Kent, } ss:

Cassius M. Loomis, being duly sworn, deposes and says
41 that he resides in the city of Grand Rapids, county of Kent, and State of Michigan; that he is a member of the firm of Loomis & Onderdonk, job printers, of Grand Rapids; that he is and has been acquainted with the price and value of printing records for use in the circuit court of the United States for the western district of Michigan, southern division, and the supreme court of the State of Michigan; that he has been shown a printed copy of the defendant's proof in this cause; that the price per page for such printing ranges from 60 cents to 65 cents and does not exceed 65 cents; that according to the best knowledge and belief of this deponent 60 cents is a fair and reasonable compensation per page for printing the defendant's proof in the above-entitled cause.

C. M. LOOMIS.

Subscribed and sworn to before me this 24th day of July, A. D. 1890.

GERALD FITZGERALD,
Notary Public, Kent Co., Mich.

Circuit Court of the United States, Western District of Michigan, Southern Division.

THE BELDING MAN'F'G CO.
vs.
CHALLENGE CORN PLANTER CO. } In Equity. No. 693.

STATE OF ILLINOIS, }
County of Cook. }

Taylor E. Brown, of lawful age, being duly sworn, deposes and says that he is one of the solicitors for the complainant in the above-entitled cause, and that on Tuesday, June 24, 1890, he called at the office of Messrs. Taggart & Denison, in Grand Rapids, Michigan, at about eleven o'clock in the forenoon; that he then and there saw Mr. Taggart, one of the solicitors for the defendant herein, and had conversation with Mr. Taggart about this case.

42 Affiant further states that at said time and place Mr. Taggart asked affiant for another copy of complainant's printed

record and asked affiant what it cost affiant to have said record printed in Chicago; to which affiant replied, "Ninety cents per printed page." Mr. Taggart then remarked, "That is more than we have to pay here, and while yours is much finer work ours is very good and answers the purpose very well."

Affiant then asked Mr. Taggart what he, Taggart, paid for the printing of defendant's record; to which the said Mr. Taggart replied, "We have to pay anywhere from sixty-five cents to eighty cents per page. I do not recollect just now what we did pay for this particular job." Mr. Taggart left his seat and went into the adjoining room, and when he returned, after only a momentary absence, he, Taggart, said to affiant, "The book-keeper is out now and I don't remember what we paid, but it was not over eighty cents."

Affiant is very certain that Mr. Taggart made these remarks precisely as above set forth, because affiant paid particular attention to his remarks at the time, anticipating the necessity of having affiant's recollection thereof clear and correct in the event of an adverse decision; and further affiant saith not.

TAYLOR E. BROWN.

Subscribed and sworn to before me this 24th day of July, A. D. 1890.

[NOTARIAL SEAL.] C. CLARENCE POOLE,
Notary Public.

43 Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

And now comes the said complainant, by Poole & Brown, solicitors, and McGarry & Ford, of counsel, and specifically objects to the taxation or allowance in favor of the said defendant and against the said complainant of the following items mentioned and set forth in the proposed bill of costs in this cause, viz:

The item charged as solicitors' fee for 10 depositions at $2.50 each..... $25 00

because the printed record of defendant's proof shows that the depositions of Hotchkiss, Martin, A. W. Ranney, Brown, Gardner, See, and Scofield, being seven in all (see pages 49 to 169, inclusive), are entitled in and were taken under the cross-bill as well as the original bill. The statement is made in the record in the deposition of each of those witnesses that it is taken not only in behalf of the defendant to the original bill, but on behalf "of the complainant in the cross-bill entitled above." There is no way of determining how much of such deposition was taken solely in support of the cross-bill and how much was taken solely in support of the answer to the original bill. Inasmuch as the complainant in this suit recovers

costs in the cross-bill, $17.50 of this item either should be stricken out of the taxation of costs in this cause or that amount al-
44 lowed by way of set-off in the cross-suit.

Notary's fees for depositions, Hugh E. Wilson..... $92 50

This is objected to because the depositions charged were taken in the cross-suit as well as in the original suit, and each deposition shows that it is taken in behalf of the complainant in the cross-suit. In the cross-suit the defendant succeeds and is entitled to tax costs against the complainant therein. The cross-suit was the first cause disposed of, but inasmuch as the depositions are entitled in and taken in support of both cases the notary fees should be equally divided.

The items charged for copies of patents, $1.70, and file-wrappers and contents, $4.00, and three Patent Office models, $21.00, are objected to for the reason that there is no statute authorizing the allowance of these items as charged against the defendant. The models were not complete. They purported to be models of the identical patents offered in evidence. The court did not consider the models at the hearing. There are no affidavits attached to the bill of costs to show whether the models were charged for at cost.

The item for printing record (164 pages at 90 cents per page), $147.60, is objected to for the following reasons:

1. Pages from 18 to 24, inclusive, being 7 pages in all, relate exclusively to the cross-bill, being the printed copy of the cross-bill and replication.

2. The record from pages 49 to 169, inclusive (121 pages), is a testimony entitled in and taken under the original bill and cross-bill. There is no way of telling how much of this goes in support of the cross-bill and how much in support of the answer to the original bill, and hence the clerk cannot tax against the defendant in this suit. This entire bill is charged. The printing of those pages should be equally divided.

45 3. The price charged is grossly excessive, as shown by the affidavits hereto subjoined.

The item for express and freight charges in bringing certain exhibit refrigerators to Grand Rapids, $11.20, is objected to because there is no statute or rule of court authorizing the taxation of freight charges.

The items charged for witness fees, amounting to $69.50, should not be allowed as per bill rendered for the following reasons:

(1.) There is no showing that each of the witnesses were actually paid the amount charged.

(2.) The last seven witnesses were examined under the cross-bill as well as the original bill. The cross-bill was first disposed of. (See section 848, Desty's Federal Procedure, 7th edition, page 444.)

All of which objections are based upon the records and file in said cause, the printed copy of defendant's proofs, and the affidavits

of Isaac S. Digert, C. M. Loomis, Harvey O. Carr, and Taylor E. Brown.

POOLE & BROWM,
Sol'rs for Compl't.
McGARRY & FORD,
Of Counsel.

46 [Endorsed:] No. 963. U. S. circuit court for the western district of Michigan, southern division. In equity. Belding M'f'g Co., complainant, *vs.* Challenge Corn Planter Co., defendant. Objection to taxation of costs. Filed Aug. 16, 1890. C. L. Fitch, clerk. McGarry & Ford, of counsel for comp't.

47 UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING M'F'G CO., Compl't,
vs.
CHALLENGE CORN PLANTER CO., Def't.

COUNTY OF KENT, *ss:*

Edward Taggart, being duly sworn, says that he has read the affidavit of Taylor E Brown concerning a conversation with affiant June 24 at affiant's office; that affiant has no recollection of any such conversation or any conversation on that subject at the city of Grand Rapids; that it is utterly impossible that affiant could have understandingly made any such statements as are attributed to him in such affidavit, because affiant at that time knew that the price to be charged was 90 cents per page, but there was at that time nothing on the books of Taggart & Denison showing the amount of such payment, and such payment had not then been made; that if said Brown, as his affidavit indicates, was fishing for evidence he did it so very carefully that he concealed from affiant the fact that he was talking about this case.

Affiant further says that the entire arrangement for printing was made by Levi Scofield, defendant's manager, with Eber Rice, and that affiant had no information whatever about said arrangement until informed by Mr. Scofield that he had made it, and that the price was 90 cents.

EDWARD TAGGART.

Subscribed and sworn to before me this 6th day of August, 1890.
ARTHUR C. DENISON,
Notary Public, Kent Co., Mich.

48 [Endorsed:] No. 963. U. S. circuit court. In equity. Belding Co. *vs.* Challenge Co. Affidavit. Filed Aug. 16, 1890. C. L. Fitch, clerk. Taggart & Denison, def't's sol'rs.

49 In the Circuit Court of the United States of America for the Western District of Michigan, Southern Division.

BELDING MAN'F'G CO., Appellant,
vs.
CHALLENGE CORN PLANTER CO., Respondent. } In Equity.

Know all men by these presents that we, the Belding Man'f'g Co., a corporation organized under the laws of the State of Illinois, having its principal office in the city of Chicago, county of Cook, in said State of Illinois, principal, and Fred. E. Ranney, of Belding, Michigan, and C. Dimick Ellis, of Belding, Mich., as sureties, are held and firmly bound unto the above-named Challenge Corn Planter Company, a corporation organized under the laws of the State of Michigan, having its principal office in the city of Grand Haven, in said State of Michigan, in the sum of one thousand dollars, to be paid to the said Challenge Corn Planter Company; for the payment of which, well and truly to be made, we bind ourselves and each of us, our and each of our heirs, executors, administrators, successors, and legal representatives, jointly and severally, firmly by these presents.

Sealed with our seals and dated the 30th day of July, in the year of our Lord one thousand eight hundred and ninety.

Whereas the above-named Belding Man'f'g Co. has prosecuted an appeal to the Supreme Court of the United States to reverse the decree rendered in the above-entitled suit by the judge of the circuit court of the United States for the western district of Michigan, southern division:

Now, therefore, the condition of this obligation is such that if the above-named Belding Man'f'g Co. shall prosecute said appeal
50 to effect and answer all damages and costs if it fails to make said appeal good, then this obligation shall be void; otherwise the same shall be and remain in full force and virtue.

[Seal of the Belding Manufacturing Company.]

BELDING MAN'F'G CO.,
By WILLIAM A. STANTON, *Treasurer.* [L. S.]
FRED. E. RANNEY. [L. S.]
C. DIMICK ELLIS. [L. S.]

This bond is hereby approved in form and substance.
Aug. 20th, 1890.

H. F. SEVERENS,
Dist. Judge.

STATE OF ILLINOIS, } ss:
County of Cook, }

William A. Stanton, being duly sworn, deposes and says that he is the treasurer of The Belding Man'f'g Co., the above-named appellant; that he signed the name of said company to the above-named bond and affixed the corporate seal of said company in and by virtue of the authority vested in him by the action of the board

of directors of said company at a meeting of said directors held at the office of said company, No. 185 5th avenue, Chicago, Illinois, on Wednesday, July 23, A. D. 1890.

WILLIAM A. STANTON.

Said supersedeas bond sealed, taken, and acknowledged by the Belden Man'f'g Co. and the said oath taken and subscribed in my presence by the said William A. Stanton this 30th day of July, A. D. 1890.

[NOTARIAL SEAL.] C. CLARENCE POOLE,
Notary Public.

FRED. E. RANNEY.
C. DIMICK ELLIS.

51 Sealed, taken, and acknowledged by the said Fred. E. Ranney and C. Dimick Ellis in my presence this 9th day of August, A. D. 1890.

[NOTARIAL SEAL.] J. MILTON EARLE,
Notary Public.

Approved.

—— ——.

We are satisfied with the foregoing.

TAGGART & DENISON,
Def't's Sol'rs.

STATE OF MICHIGAN, } *ss:*
County of Ionia, }

Fred. E. Ranney and C. Dimick Ellis, being severally and duly sworn, depose and say that they each reside and own real and personal property within the county of Ionia and State of Michigan; that said county is in the jurisdiction of the United States district court for the southern division of the western district of Michigan; that they are each worth, over and above all exemptions, debts, and liabilities, at least the sum of $1,000, and that said property is located within the southern division of the western district of Michigan.

FRED. E. RANNEY.
C. DIMICK ELLIS.

Subscribed and sworn to before me this 9th day of August, A. D. 1890.

[NOTARIAL SEAL.] J. MILTON EARLE,
Notary Public in and for Ionia County, Michigan.

52 [Endorsed:] Gen'l No., 963. Term No., —. In the United States circuit court for the southern division of the western district of Michigan. Belding M'f'g Co. *vs.* Challenge Corn Planter Co. In equity. Supersedeas bond. Filed Aug. 20, 1890. C. L. Fitch, clerk. Poole & Brown, attorneys and counselors in patent causes, Owings building, Chicago, Ill., 215 Dearborn street.

53 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

Now comes the said defendant, by Taggart & Denison, its solicitors, and moves the court for an order retaxing the costs in said cause by allowing to the said defendant the following items of costs disallowed by the clerk:

Seven depositions, @ $2.50	$17 50
One-half of H. E. Wilson's notary fee	46 40
One-half printing part of record	54 00

This motion is based on the records and files of said cause.
Dated Aug. 21, 1890.

TAGGART & DENISON,
Defendant's Solicitors.

54 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant,

Now comes the said complainant, by Poole & Brown, its solicitors, and McGarry & Ford, of counsel, and moves the court for an order retaxing the costs in said cause by disallowing to the said defendant the following items of costs allowed by the clerk, to wit:

Notaries' fees for depositions, Hugh E. Wilson	$76 10
17 copies patents in evidence	1 70
File-wrapper and contents	4 00
3 Patent Office models	21 90
Printing record	93 60

Witness fees as follows:

Albert A. Spear, Chas. H. Jacobs, and James E. Smith, each $1.60	4 80
Levi Scofield	4 70
A. W. Ranney, S. M. Brown, A. J. Gardner, $6.30 each	18 90
George R. Hotchkiss, $14.80; John C. Martin, $13.30; and James W. See, $13.00	41 10
Total	266 80

Which motion is based on the records and files in said cause. Dated August 22nd, A. D. 1890.

POOLE & BROWN,
Solicitors for Compl'nt.
McGARRY & FORD,
Of Counsel for Complainant.

55 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

Now comes the said complainant, by Poole & Brown, its solicitors, and McGarry & Ford, of counsel, and moves the court for an order retaxing the costs in said cause by disallowing to the said defendant the following items of costs allowed by the clerk, to wit:

Notaries' fees for depositions, Hugh E. Wilson	$76 10
17 copies patents in evidence	1 70
File-wrapper and contents	4 00
3 Patent Office models	21 90
Printing record	93 60

Witness fees as follows:

Albert A. Spear	1 60
Charles H. Jacobs	1 60
James E. Smith	1 60
Levi Scofield	4 70
A. W. Ranney	6 30
S. M. Brown	6 30
A. J. Gardner	6 30
George R. Hotchkiss	14 80
John C. Martin	13 30
James W. See	13 00
Total witness fees	$69 50
Total other fees	197 30
	$266 80

Which motion is based on the records and files in said cause. Dated August 22nd, A. D. 1890.

POOLE & BROWN,
Solicitors for Complainant.
McGARRY & FORD,
Of Counsel for Complainant.

56 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

SIRS: Please to take notice that the annexed is a true and compared copy of a motion this day made in said cause, and that the same will be brought on for hearing before said court on Tuesday, the 26th day of August, A. D. 1890, at the opening of court on that day, or as soon thereafter as counsel can be heard.

Dated August 22nd, A. D. 1890.

POOLE & BROWN,
Complainant's Solicitors.
McGARRY & FORD,
Of Counsel for Complainant.

To Messrs. Taggart & Denison, solicitors for defendant.

57 [Endorsed:] No. 963. United States circuit court for the western district of Michigan, southern division. Belding Manufacturing Company, complainant, *vs.* Challenge Corn Planter Company, defendant. Motion and notice. Filed Aug. 26, 1890. C. L. Fitch, clerk. McGarry & Ford, of counsel for complainant.

58 THE UNITED STATES OF AMERICA,
Western District of Michigan, Southern Division, } *ss:*

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

THE BELDING MANUFACTURING COMPANY, Complainant and Appellant,
vs.
THE CHALLENGE CORN PLANTER COMPANY, Defendant and Appellee.

I, Charles L. Fitch, clerk of the circuit court of the United States for the western district of Michigan, do hereby certify that the annexed is a true copy of the record and all the proceedings in the above-entitled cause, except so far as original exhibits are included therein pursuant to the stipulation of the parties in this cause, which stipulation has been heretofore duly approved in writing by the Honorable Henry F. Severens, district judge, before whom said cause was brought to final hearing.

And I further certify that the original exhibits so included herein constitute all of the exhibits in the case and, with that portion of the record and proceedings whereof a copy is annexed as aforesaid, constitute the whole of the records and proceedings in said cause.

Seal of the U. S. Circuit Court, Southern Division, Western District of Mich.

Witness my official signature and the seal of said circuit court, at Grand Rapids, in said district, this sixth day of October, in the year of our Lord one thousand eight hundred and ninety.

CHARLES L. FITCH, *Clerk.*

59 In the United States Circuit Court, Western District of Michigan, Southern Division.

BELDING MANUFACTURING CO., Complainant,
vs.
CHALLENGE CORN PLANTER CO., Defendant. } In Equity. No. 963.

Complainant's Pleadings and Proofs.

Poole & Brown, solicitors and of counsel for complainant.

No. 963. Filed Jun- 25, 1890.

C. L. FITCH, *Clerk.*

60 In the United States Circuit Court, Western District of Michigan, Southern Division.

BELDING MANUFACTURING CO., Complainant,
vs.
CHALLENGE CORN PLANTER CO., Defendant. } In Equity. No. 963.

Complainant's Pleadings and Proofs.

Poole & Brown, solicitors and of counsel for complainant.

61 *Bill of Complaint.*

In the Circuit Court of the United States, Western District of Michigan, Southern Division.

To the honorable the judges of the circuit court of the United States in and for the southern division of the western district of Michigan, in chancery sitting:

The Belding Manufacturing Company, a corporation existing under and by virtue of the laws of the State of Illinois, having its principal office at Chicago, Illinois, and being a citizen of said State, brings this its bill of complaint against the Challenge Corn Planter Company, a corporation doing business at and a resident of the city of Grand Haven, State of Michigan, in said district.

And thereupon your orator complains and says that, prior to the 2d day of March, 1878, one Richard T. Hambrook, of Chicago, Cook county, Illinois, was the true, original and first inventor of certain new and useful improvements in refrigerators, not known and used by others before his said invention thereof, and which has not, at the time of his application for a patent therefor, been in public use or on sale with his knowledge or consent in any country for a period of two years, as your orator verily believes; and thereupon

said Richard T. Hambrook, so being the inventor of said improvements, and being a citizen of the United States aforesaid, made application to the proper department of the Government of the
62 United States for letters patent therefor, in accordance with the then existing laws of Congress; and he having duly complied in all respects with the conditions and exactions of said laws, such proceedings were had that on the twenty-eighth day of May, eighteen hundred and seventy-eight, letters patent of the United States for said improvement and invention, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing the date of the day and year last aforesaid, and numbered 204,216, were on said date issued in due form of law and delivered to said Richard T. Hambrook, whereby was granted and secured to him and his heirs, executors, administrators or assigns, for the term of seventeen years from the day of the date thereof, the full and exclusive right of making, using, and vending to others to be used, the said improvement and invention, a description whereof is given in the words of the said invention in a schedule in writing made a part thereof, as by said original letters patent or a duly authenticated copy thereof in court to be produced, will more fully appear.

Your orator shows unto your honors that afterwards your orator, The Belding Manufacturing Company, became vested with the entire right, title and interest in said invention and letters patent by assignment in writing from the said Richard T. Hambrook and his several assignees as by the several original assignments and instruments in court to be produced will more fully appear.

Your orator further shows unto your honors that by virtue of the premises your orator became and is now the sole and exclusive owner of the said letters patent and the invention and improvement therein described, and of all the rights and privileges granted and secured or intended to be granted and secured thereby.

63 Your orator further shows unto your honors that large numbers of refrigerators have been made in accordance with said letters patent, and sold by said Hambrook and by his assignees prior to the date of the acquisition by your orator of the entire right, title and interest in the said letters patent, and that to your orator's knowledge there has been no infringement thereof, but on the contrary, the public has for years acquiesced in the validity of the said letters patent.

And your orator shows unto your honors that your orator has been engaged in the manufacture and sale of said invention for several years, and that during this period it has built a large and extensive trade in the same, and has made said invention profitable to itself and to the public by selling large numbers of refrigerators made in accordance with said invention; that it has agents in many parts of the United States and Territories, and that your orator being so engaged in the manufacture and sale of said invention has complete facilities for supplying all demands of the public and of the trade for said invention, and would be to-day so completely supplying such demands and enjoying the benefits and profits therefrom,

but for the unlawful infringement upon your orator's rights hereinafter complained of.

Your orator further complains and says that the defendant, well knowing all the facts as hereinafter set forth, and having been duly notified thereof, but contriving to injure your orator and to deprive it of the benefit and advantages which might and otherwise would accrue to it from said invention and letters patent, and conspiring and confederating with its agents, attorneys and with divers persons to your orator unknown, to injure your orator and your orator's
64 business, have made and sold in the city of Grand Haven, in the State of Michigan, and, as your orator is informed, elsewhere in the United States and Territories thereof, without your orator's license and permission, and against the will of your orator, and in violation of its rights, large numbers, but how many your orator is not informed, of refrigerators embodying the said invention and constructed substantially as set forth, described and claimed in said letters patent No. 204,216; that said manufacture and sales were and are in direct violation and infringement of said letters patent, and to the great damage and injury of your orator; and your orator is informed and believes it to be true, that the said defendant is now continuing, and intends and threatens to continue hereafter, the manufacture and sale of the said invention; that the further continuance thereof, as aforesaid, is and will work to your orator great and irreparable damage, loss and injury; that the refrigerators made and sold by the said defendant and which embody the said invention as aforesaid, are such an exact copy and imitation both in their interior and their exterior construction, arrangement and ornamentation, of the refrigerators made and sold by the complainant under the said letters patent, that the public and purchasers of such articles have been deceived and have been unable to detect any difference between your orator's refrigerators and the refrigerators of the defendants complained of herein.

Your orator is informed and believes it to be true that the defendant has made and realized large gains and profits from its unlawful manufacture and sale of the said invention so secured exclusively to your orator as aforesaid; but your orator does not know the amount of such gains and profits, and therefore prays that the said defendant may be required to make full disclosures
65 thereof to this honorable court; that the defendant, although requested, refuses to desist from infringing your orator's said letters patent, and refuses to account for and pay over to your orator the gains and profits so unlawfully made by it as aforesaid; and that your orator is informed and believes it to be true, that the said defendant and its agents and confederates have on hand a large number of refrigerators embodying and made in accordance with the said invention so secured exclusively to your orator, manufactured, or partially so, at Grand Haven, Michigan, and elsewhere, ready for sale and use, and which they intend and threaten to sell, give away or otherwise put into use without your orator's permission and license and to the great and irreparable loss and injury to the rights of your orator herein.

All of which actings and doings of the said defendant are contrary to equity and good conscience, and tend to the manifest wrong and injury of your orator, in the premises.

In consideration thereof, and forasmuch as your orator can have no adequate relief only in this honorable court, where matters and doings of this sort are recognizable and relievable; and to the end, therefore, that the said defendant may, if it can, show why your orator should not have the relief hereby prayed, and may according to the best and utmost of its knowledge, remembrance, information and belief, but not under oath, answer under oath being expressly waived, full, true, direct and perfect answer make, to all and singular the matters and things stated and charged; and may be decreed to account for and pay over to your orator all gains and profits realized by it from the unlawful making, using and vending the improvement vested in your orator as aforesaid, to pay
66 your orator for all damages and losses caused to your orator by the said unlawful acts of said defendant; and may be compelled to desist the further infringement of your orator's said letters patent.

Wherefore your orator prays:

1. That the defendant may answer the premises.

2. That the defendant may be decreed to account and pay over to your orator such gains, profits and damages as this honorable court shall direct, and the costs of this suit.

3. That the defendant may be enjoined during the pendency of this suit, and also perpetually enjoined from such infringement.

4. That the defendant may be compelled to destroy under the direction of this honorable court, or to deliver to your orator for that purpose, all refrigerators now in its possession or in the possession of its agents, attorneys, servants or workmen, containing and made in accordance with your orator's said invention.

5. That your honors, upon rendering the decree for such infringement as herein prayed for, may proceed to assess or cause to be assessed under your direction, in addition to the profits to be accounted for by the defendant as aforesaid, the damages your orator has sustained by reason of the said infringement, and that your honors may increase the actual damages, as assessed, to a sum equal to three times the amount of such assessment, under the laws in such cases made and provided, and by reason of the unjust, unlawful and malicious conspiracy and infringement by said defendant, as herein set forth.

May it please your honor- to grant unto your orator the writ of injunction of this court, provisionally enjoining and restrain-
67 ing said defendant, Challenge Corn Planter Company and its clerks, attorneys, agents, servants and workingmen from making and using and vending any refrigerator or any portion thereof containing and made in accordance with said invention during the pendency of this suit, and also the writ of injunction of this court, perpetually enjoining and restraining said defendant, Challenge Corn Planter Company, and its clerks, attorneys, agents, servants and workingmen from making and using and vending all or any

portion of any refrigerator containing and made in accordance with said invention, and that your orator may have such other or further relief as the nature of the case may require, and to your honors may seem meet.

May it please your honors to grant unto your orator not only the writ of injunction conformable to the prayer of this bill, but a writ of subpœna, directed to said defendant, Challenge Corn Planter Company, commanding it on a certain day therein to be named, to be and appear in this court then and there to answer the premises, and to stand to, perform and abide by such further order, direction and decree as may be made against said defendant.

And your orator, as in duty bound, will ever pray, etc.

THE BELDING MANUFACTURING COMPANY,
By WILLIAM A. STANTON, *Its Treasurer.*

POOLE & BROWN,
Solicitors and of Counsel.

68 UNITED STATES OF AMERICA.

STATE OF ILLINOIS, }
County of Cook, } *ss:*

William A. Stanton, of Chicago, Cook county, Illinois, being first duly sworn, deposes and says: That he is the treasurer of The Belding Manufacturing Company, the complainant named in the foregoing bill of complaint; that he has read said bill and knows the contents thereof; and that the allegations thereof are true of his own knowledge, except as to those matters stated on information and belief, and as to such matters he believes them to true.

WILLIAM A. STANTON.

Subscribed and sworn to before me this 29th day of March, A. D. 1889, at Chicago, Illinois.

T. EVERETT BROWN,
[SEAL.] *Notary Public.*

69 In the United States Circuit Court for the Southern Division of the Western District of Michigan.

BELDING MANUFACTURING CO. }
vs. } In Equity. No. 963.
CHALLENGE CORN PLANTER CO. }

Replication.

This repliant, saving and reserving to itself now and at all times hereafter, all and all manner of benefit and advantage of exception which may be had or taken to the manifold errors and insufficiencies of the said answer, for replication thereunto, says that it will ever maintain and prove its bill of complaint to be true, certain and sufficient in the law to be answered unto; and that the said answer of the said defendants is uncertain and untrue and in-

sufficient to be replied unto by repliant without this; that any other matter or thing whatsoever in the said answer contained, material or effectual in the law to be replied unto and not herein and hereby well and sufficiently replied, confessed and avoided, traversed or denied, is true; all which matters and things this repliant is, and will be ready to aver, maintain and prove as this honorable court shall direct, and prays as in and by its said bill it has already prayed.

THE BELDING MANUFACTURING COMPANY,
By POOLE & BROWN, *Its Solicitors.*

POOLE & BROWN,
Solicitors and of Counsel.

70 United States Circuit Court, Western District of Michigan, Southern Division.

BELDING MANUFACTURING COMPANY
vs.
CHALLENGE CORN PLANTER COMPANY. } In Equity. No. 963.

Met pursuant to notice at the offices of Poole & Brown, No. 225 Dearborn street, Chicago, Illinois, on Monday, May 6, 1889, at 10 o'clock in the forenoon, to take testimony on behalf of complainant in the above-entitled cause, before M. L. Price, notary public, in pursuance of stipulation, to be read in evidence for and on behalf of the complainant at the hearing of the above-entitled cause.

Present: Taylor E. Brown, Esq., counsel for complainant.

And thereupon counsel for complainant introduces the telegram marked "Stem Telegram No. 1" as follows:

"CINCINNATI, OHIO, 5, 3, 1889.

To Poole & Brown, 225 Dearborn St.:

Mrs. Stem very ill. Must beg short postponement of testimony. Won't you accommodate me?

ARTHUR STEM."

And thereupon an adjournment was had until Wednesday, May 8th, at 10 o'clock in the forenoon.

CHICAGO, ILLINOIS, *May* 8, 1889.

Met pursuant to adjournment.

Present: Taylor E. Brown, Esq., counsel for complainant. No one appearing for or on behalf of defendant.

And thereupon counsel for complainant introduces in evidence a telegram, marked "Stem Telegram No. 2," as follows:

71 "CINCINNATI, OHIO, 5, 6, 1889.

To Poole & Brown, 225 Dearborn St.:

Impossible for me to attend at Chicago on Wednesday. The suit entirely in my charge. Answer.

ARTHUR STEM."

Counsel for complainant thereupon states that upon receipt of the foregoing telegram from Arthur Stem, Esq., counsel for defendant, a telegram was sent to Mr. Stem as follows, to wit:

"CHICAGO, *May* 6, 1889.

Arthur Stem, 216 Main St., Cincinnati, Ohio:

Must take Dayton's deposition Wednesday. Will postpone others until later. Can you let Dayton's cross-examination go over until after you have taken defendant's proofs? He will then have returned from Europe. Answer.

POOLE & BROWN."

Counsel for complainant also introduces a telegram marked "Stem Telegram, No. 3," as follows, to wit:

"CINCINNATI, OHIO, 5, 6, 1889.

"To Poole & Brown, No. 225 Dearborn St.:

"All right.

"ARTHUR STEM."

And states that such telegram was received by him on the morning of May 7, 1889.

And thereupon counsel for complainant offers in evidence certified copy of letters patent of the United States No. 204,216, issued May 20, 1878, to Richard T. Hambrook, for improvement in refrigerators, and identifies the same with this record as "Complainant's Exhibit Hambrook Patent."

72 Also, certified copy of the records of the secretary of the State of Illinois, for certificate of incorporation of the Richard T. Hambrook Manufacturing Company, and the same is identified with this record as "Complainant's Exhibit Incorporation Hambrook Company."

Also, certified copy from the records of the United States Patent Office in the matter of the assignment of letters patent No. 204,216, and the same is identified with this record as "Complainant's Exhibit Hambrook Assignment."

Also, certified copy from the records of the secretary of the State of Illinois, in the matter of the change of name of Richard T. Hambrook Manufacturing Company to The Booth & Osgood Manufacturing Company, and the same is identified with this record as "Complainant's Exhibit Certificate of Change of Corporate Name."

Also, certified copy of certain records of the superior court of Cook county, Illinois, in the matter of the suit of Henry W. Lyman *v.* Booth & Osgood Manufacturing Company, in equity, No. 89278, and the same is identified with this record as "Complainant's Exhibit Booth & Osgood Suit Records."

Also, an instrument in writing, purporting to be an assignment of United States letters patent, No. 204,216, by William A. Stanton, receiver, to James W. Vail, the same having been duly recorded in the United States Patent Office on December 17, 1885, in Liber L

33, page 310 of Transfers of Patents, and the same is identified with this record as "Complainant's Exhibit Stanton Assignment."

Also, an instrument in writing, purporting to be an assignment of letters patent No. 204,216, by James W. Vail to H. H. Belding, the same having been duly recorded in the United States
73 Patent Office, December 17, 1885, and recorded in Liber L 33, page 313, of Transfers of Patents, and the same is identified with this record as "Complainant's Exhibit Vail Assignment."

Also, an instrument in writing purporting to be an assignment of United States letters patent No. 204,216, by Hiram H. Belding to the Belding Manufacturing Company, having been duly recorded in the United States Patent Office, December 17, 1885, in Liber L 33, page 314, of Transfers of Patents, and the same is identified with this record as "Complainant's Exhibit Belding Assignment."

Counsel for complainant also offers in evidence a printed pamphlet purporting to be an illustrated catalogue of the Belding Manufacturing Company, and identifies the same with this record as "Complainant's Exhibit Belding, 1889, Catalogue."

Also, a printed pamphlet purporting to be the fourth annual illustrated catalogue of the Challenge Corn Planter Company, and the same is identified with this record as "Complainant's Exhibit Defendant's, 1889, Catalogue."

Counsel for complainant also offers in evidence the refrigerator bearing upon its front a plate marked "New Perfection. Manufactured by Belding Manufacturing Company, Belding, Michigan," and the same is identified with this record as "Complainant's Exhibit Complainant's Refrigerator."

Also, two refrigerators, each bearing upon its front a plate marked "Challenge Iceberg. Challenge Corn Planter Company, Grand Haven, Michigan." One of said refrigerators containing two provision chambers, the other containing one provision chamber, and the same are identified with this record, respectively, as "Complainant's Exhibit Defendant's Refrigerator No. 1," and "Complainant's Exhibit Defendant's Refrigerator No. 2."

74 Counsel for complainant also offers in evidence copy of a letter signed by Poole & Brown, dated February 12, 1889, addressed to the Challenge Corn Planter Company, Grand Haven, Michigan, and the same is identified with this record as "Complainant's Exhibit Complainant's Notice of Infringement."

Also, a letter dated Grand Haven, Michigan, February 25, 1889, addressed to Messrs. Poole & Brown, and signed Challenge Corn Planter Company, per Schofield, and the same is identified with this record as "Complainant's Exhibit Defendant's Letter."

And thereupon MELVILLE E. DAYTON, a witness produced on behalf of complainants, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. BROWN, Esq., as follows:

Q. 1. What is your name, age, residence and occupation?

A. Melville E. Dayton; age, fifty-three years; residence, Chicago, Illinois, and occupation mechanical expert and solicitor of patents.

Q. 2. Please state what experience you have had in mechanics,

inventions and letters patent for inventions, and in the comparison of inventions with letters patent which would tend to qualify you to testify as an expert in this suit?

A. Equipped with a natural taste for mechanics, an early practical training in both theoretical and practical mechanics, and an early and long-continued acquaintance with the construction and operation of machinery generally, I have had an experience of seventeen years as solicitor of patents, and about twelve years
75 as an expert witness in patent suits. In my said experience as a patent solicitor and expert, I have been continually engaged in the critical examination and analysis of machinery, the comparison of machines with each other and the comparison of mechanisms with letters patent. As patent solicitor, I have prepared or supervised the preparation of specifications and drawings in about two thousand applications for patents, covering a great variety of mechanisms and calling for extended and careful study of patents and the principles of the machines therein set forth, as well as of those sought to be patented; and as an expert I have testified many times each year also concerning a great variety of structures and patent matters. I have had occasion to thoroughly examine the art in refrigerators, in connection with the preparations of applications for patents upon refrigerators, and am familiar with the principles of air circulation and refrigeration.

Q. 3. Have you examined United States letters patent No. 204,216, issued to R. T. Hambrook, May 28, 1878, for improvement in refrigerators, and do you understand the invention therein set forth and claimed?

A. I have examined said letters patent, and believe that I understand the same and the invention therein set forth and claimed.

Q. 4. Have you examined the refrigerator here introduced as "Complainant's Exhibit Complainant's Refrigerator," and if so, state whether or not said refrigerator, in your judgment, is made substantially in accordance with the description and drawing of complainant's said letters patent?

A. I have examined said refrigerator, and, in my judgment, it is made in accordance with the drawing and specification of said letters patent, the only differences being in minor details of
76 mechanical construction and such as have, in my opinion, no bearing on the operation of the device.

Q. 6. Please state what you understand to be the invention set forth and claimed in the said Hambrook patent?

A. The patent illustrates and describes a domestic or household refrigerator, containing an ice-box at the top, a lid over the ice-box, a provision chamber or chambers below the ice-box, a partition separating the ice-box from the provision chamber or chambers, a central passage through this partition, for the downflow of cold air from the ice-box to the provision chamber, side passages rising from the provision chamber outside of the ice-chamber to near the top of the latter, overhanging cleats or shields covering these side passages, gutters at the margins of the central opening in the partition to prevent the passage of water from the ice-chamber into the pro-

vision chamber, a deflecting plate over said central opening, to carry the water, which would drip directly through said central opening, to the top of the partition at the sides of said opening, so that the gutters shall carry away all water or moisture falling from the ice or its supporting rack, and a pipe for draining off the water delivered thereto by the gutters. The patent shows a vertical partition dividing the provision chamber into two compartments, said partition being extended up through the central opening in the horizontal partition and into the ice-chamber. I do not regard this vertical partition as an essential element of the invention, or as in any way necessary to the particular operation of the refrigerator. In refrigerators of the larger sizes, it would commonly be employed as a matter of convenience, but in the smaller sizes it would naturally be omitted.

77 The claim of the patent reads as follows:

"In combination with the provision chambers B B, the ice-chamber C, having rack *c'*, and double inclined bottom pieces *x* and *y*, provided with a central opening guarded by the deflector plate K, and provided also, with the side passage *c* from the provision chamber and the trough *z*, and pipe *z*, all substantially as described and shown, for the purpose set forth."

The last letter *z* should be *z'*. I notice that the claim reads in the plural, in speaking of the provision chambers B B, but in the statement of the invention, in the second paragraph of the specification, and elsewhere in the specification, the provision chamber is spoken of in the singular number as well as in the plural. For example, in the last sentence of the last paragraph but one, in column 2 of page 1 of the specification, the provision chamber is mentioned in the singular number twice, and in connection with both passages *c c*, and both of the shields which overhang and guard the upper ends of said passages. At other points in the specification the provision space is spoken of as the "provision chambers B B." I conclude, therefore, that it is the intent of the patent to make no distinction between single and the double or divided provision space of the refrigerator, and that the vertical partitions *a* is consequently not an essential element of the invention, or an element of the claim.

By the terms "double inclined bottom pieces *x* and *y*, provided with a central opening, guarded by the deflector plate K," I understand to be meant the two parts of what I have called the horizontal partition, which divides the upper ice-chamber from the lower provision chamber or chambers. By the word "double" I understand that reference is had to the central division of this par-

78 tition into two parts, or, in other words, that the two-part bottom piece or partition is divided by a central passage; the effect of the description being to locate the position of this passage at the middle of the partition.

I notice further that the specifications and drawings indicate an inclination of the bottom pieces or parts of the partitions towards the central opening *d*, but I do not understand that it is vital to the invention that the inclination, (which is merely for drainage purposes), shall be in this particular direction.

The claim, in my understanding of it, includes the combination of the provision space, whether it be a single or divided chamber; the ice-chamber located over the provision chamber or chambers; an ice-rack in the ice-chamber for the support of the ice; a two-part inclined partition, substantially horizontal, dividing the ice-chamber from the subjacent provision chamber or chambers and having a central opening for the downflow of air from the ice to the provision chamber; a deflector plate located over this central opening in said horizontal partition; troughs or their equivalents, and a discharge pipe for conducting away the water which falls upon the horizontal partition and for preventing its passage through the central opening into the provision chamber; and passages *c c*, leading upward from the provision chamber past the ends of the ice-chamber and opening laterally into said ice-chamber near its top. These passages probably include a shield over each of them to prevent ice or other ponderable substances from falling into them when the lid which covers the ice-chest is raised.

Q. 6. Please examine Complainant's Exhibit Defendant's Refrigerator No. 1, and Complainant's Exhibit Defendant's Re-
79 frigerator No. 2, and compare the same respectively with the Complainant's Exhibit Hambrook Patent, and also with Complainant's Exhibit Complainant's Refrigerator, and state whether or not you find in either or both of said Exhibits Nos. 1 and 2 the invention described and claimed in said Hambrook patent. You may also state what similarity, if any, in your opinion, exists in the constructions of complainant's and defendant's refrigerators.

A. I have made the comparison called for by the question, and I find that each of said exhibits, Defendant's Refrigerator No. 1 and Defendant's Refrigerator No. 2 contains essentially the same construction and arrangement of the parts and passages and chambers as are set forth and described in the said Hambrook patent, and, in my opinion, each of said exhibit refrigerators contains the invention set forth and claimed in said patent. The construction of the Exhibit Defendant's Refrigerator No. 1 is, in all its essential parts, and even in its details, substantially a copy of Exhibit Complainant's Refrigerator. Both are of the larger class, involving a division of the provision chamber by means of a vertical partition, answering to the partition *a* of the complainant's patent, and with respect to this partition as with respect to other features of construction, the refrigerator exhibits are almost indistinguishable from each other in any particular. Defendant's Exhibit Refrigerator No. 2 is of the smaller kind, requiring and having no vertical partition in the provision chamber. In all other particulars it is like the defendant's refrigerator No. 1 and defendant's refrigerator No. 2.

Q. 7. State your reasons for the opinion which you have expressed, to the effect that defendant's refrigerators Nos. 1 and 2 severally contain the invention of the Hambrook patent?

80 A. The reasons are furnished on a mere visual inspection of said defendant's refrigerators, and a comparison thereof with the drawings, description and claims of the complainant's patent. The said defendant's refrigerators have the provision

chamber or chambers, B B, the ice-chamber, C, above the provision chamber or chambers; a rack answering to the rack p', of the patent in the ice-chamber; a horizontal partition divided into two parts by a central opening running in a direction from front to rear, and answering to the "double-inclined bottom pieces, x and y" of the patent and claim; a deflector plate over and guarding this opening, and answering to the deflector plate, K, of the patent and claim; side passages extending from the top of the provision chamber to near the top of the ice-chamber and passing up at the side of such ice-chamber, which answer to the side passages, c, c, of the patent and claims; shields arranged over the top of said passages, c, c, and answering to the projections, e, e, of the patent; upturned flanges on the metal covering of the bottom pieces, x and y, and answering to the troughs, z, z, of the patent, and a discharge pipe for the water, answering to the pipe, z', of the patent. I do not fail to notice that the rack for supporting the ice is slightly different in said defendant's refrigerators from that shown in patent, being of corrugated sheet metal, resting on longitudinal bars, instead of "narrow strips of hard wood or other suitable substance," resting on similar bars, as shown in the patent. The defendant's rack answers the same purpose as the complainant's, not only of upholding the ice, but of admitting the air to the under side of the ice, and the difference is, in my judgment, merely a mechanical one, and not a departure from the invention of the patent.

81 I also do not fail to notice that in the defendant's refrigerators the "bottom" pieces forming the two-part horizontal partition, have an inclination to the rear of the refrigerator, instead of towards the central space between them, as shown in the patent. This is, in my opinion, manifestly a mere mechanical variation and not at all a departure from the invention of the patent. The same is true, in my judgment, of the variations presented by these defendants' refrigerators with respect to the troughs at the margin of the central opening in the horizontal partition, or between the bottom pieces x and y. In the patent, the sheet-metal covering of said bottom pieces is extended beyond the edge of said opening, and there formed into a trough by bending the same down and then up. In the defendant's refrigerator the same extension of the same piece of metal is bent up only, but manifestly with the same result of preventing the water from passing through the opening and conducting it to the top of the outflow pipe z'. This variation is one that is well known in the art and is often seen in house roofing, in which art the gutter is sometimes formed as a trough below the edge of the roof proper, while in other cases it is formed by an upturned flange at or near the lower edge of the roof.

I also do not fail to notice that the deflector plate answering to the deflector plate K of the patent is, in defendant's refrigerators, a flat plate instead of a curved one; but this difference is immaterial inasmuch as from its similar location above the central opening between the inclined bottom pieces, it does and must perform the same function of preventing water from dripping from the ice-rack

through said opening into the provision chamber. The
82 change is, in my judgment, a merely mechanical and formal one. It is, also in my judgment, of no consequence that in defendant's refrigerators this deflecting plate is upheld by attachment to the ice-rack instead of being upheld by attachment to the partition, as shown in the patent. The essential thing, it seems to me, is the place which this deflector plate occupies, and it is not at all material, in my judgment, to what part it may be secured to retain it in that place. By looking at the drawings of complainant's patent, it is apparent that said deflector plate K may be as well secured to the ice-rack as to the partition, and that it would be impossible to determine to which the inventor intended to secure it if he made no statement on that point in the patent.

I also do not fail to notice that in defendant's refrigerator No. 1, which has the vertical partition dividing the provision chamber into two compartments, said partition terminates below the horizontal partition instead of passing through the opening in the latter to the ice-rack. I have already explained why, in my opinion, said vertical partition of the patent may be entirely dispensed with without departure from the invention therein claimed, and, of course, if it may be wholly removed, a part only may be omitted. But even if the partition were a vital part of the claim it would be a matter of mere mechanical judgment, I should say, to terminate the same at the top a few inches below the point where it terminates in the patent. Its extension and its presence at all has no bearing upon the mode of operation of the refrigerator, and the change is therefore an immaterial one.

With respect to all these variations in detail from the construction actually shown in the Hambrook patent, I notice that they are all copied from the complainant's refrigerator as constructed under this Hambrook patent.

83 With respect to the remaining details of construction, there is no variation from the patent. The side passages *c* rise from the same points of the provision chamber along the same sides of the ice-chamber, from which they are separated by the same vertical end pieces of said ice-chamber, that said passages terminate at the same point near the top of the ice-chamber over the edges of said end pieces, and that above said passages are placed the same forms of guards or shields serving to both deflect the air inwards towards the ice, and to guard such passages against the admission of ice or other bodies, which in their absence might fall into said passages.

For these reasons I am of the opinion that defendant's refrigerators Nos. 1 and 2 clearly contain the invention set forth in the Hambrook patent, and pointed out in the claim thereof.

C. Q. 8. You may state whether or not, in your opinion, the Complainant's Exhibit Complainant's Refrigerator, and Complainant's Exhibit Defendant's Refrigerator No. 1 are so similar in construction and arrangement that a person giving such attention thereto as an ordinary purchaser usually gives would be misled by such

similarity, so that he might purchase one of said refrigerators, thinking it to be the other?

A. The constructions of the two refrigerators are so nearly alike, not only in general but in their minor details, that an ordinary purchaser could not distinguish between them and so nearly alike in fact that a careful mechanic would need to have them together and to make a very close investigation to distinguish one from the other. The closeness of identity is illustrated by the application of the front part of complainant's refrigerator to the back part
84 of defendant's, both complainant's and defendant's refrigerators having been cut in two for the purpose of illustrating the interior construction, and the front section of complainant's refrigerator having its dowel pins adapted to enter corresponding holes in the rear section of the defendant's refrigerator. The refrigerator made up in part of complainant's and in part of defendant's refrigerator, thus joined, would be a working apparatus, if the joints of the leaking parts could be made close.

Q. 9. State whether or not the illustration on page 8 of Complainant's Exhibit Defendant's 1889 Catalogue discloses the invention of the Hambrook patent?

A. With the exception of the deflector plate over the central opening between the bottom pieces of the ice-chamber, it does.

And thereupon an adjournment was had until Monday, June 10, A. D. 1889, at 10 o'clock, a. m.

MONDAY, *June* 10, *A. D.* 1889—ten o'clock a. m.

Met pursuant to adjournment.

Present: Taylor E. Brown, Esq., counsel for complainant; Arthur Stem, Esq., counsel for defendant.

And thereupon counsel for complainant offers in evidence three printed books purporting to be illustrated catalogues of refrigerators manufactured by the Belding Manufacturing Company and bearing date 1885, 1886, 1887, and identifies the same with this record respectively as "Complainant's Exhibit Belding 1885 Catalogue," "Complainant's Exhibit Belding 1886 Catalogue," and "Complainant's Exhibit Belding 1887 Catalogue."

85 And thereupon HIRAM H. BELDING, a witness produced on behalf of complainant, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. Hiram H. Belding; age, fifty-four years; residence, Chicago, Illinois, and occupation, president of the Belding Manufacturing Company, and vice-president of Belding Brothers & Company, silk manufacturers.

Q. 2. What is the business of the Belding Manufacturing Company?

A. Manufacturing and selling refrigerators.

Q. 3. Where?

A. Belding, Ionia county, Michigan.

Q. 4. And the office of the Belding Company is where?

A. 185 5th avenue, Chicago.

Q. 5. Is the Belding Manufacturing Company a corporation; and if so, under the laws of what State was it incorporated?

A. Under the laws of the State of Illinois.

Q. 5. State when your company was incorporated, if you know?

A. In the fall of 1884. I cannot give you the exact date. I think in September.

Q. 6. When did your company begin to manufacture and sell refrigerators?

A. We began the manufacture of refrigerators in the fall of 1884, and commenced selling in the winter of 1885.

86 Q. 7. What refrigerator did you make and sell at that time?

A. The New Perfection.

Q. 8. What do you mean by "The New Perfection" refrigerator?

A. We were manufacturing under a patent issued to R. T. Hambrook, and the name of his refrigerator was "The Perfection." We changed our name to "New Perfection."

Q. 9. If you remember the date and number of that patent, you may state what it is.

A. I do not remember the date and number.

Q. 10. I show you letters patent No. 204,216, to R. T. Hambrook, for improvement in refrigerators, dated May 28, 1878, and ask you whether or not this is the patent you referred to in your answer to question 8?

A. That is the patent.

Q. 11. State how you came to so manufacture refrigerators under this Hambrook patent, in the fall of 1884?

A. Booth & Osgood Manufacturing Company were manufacturing this refrigerator. They failed in 1883, I think, and Mr. Stanton, a member of our firm, was appointed receiver of that concern. After running it some time, a year or more, he sold out the business, and I bought of Mr. Vail the refrigerator part of the business. Mr. Vail bought the assets of the Booth & Osgood concern, and sold to me the refrigerator, the whole stock, patent and tools for manufacturing refrigerators, that they had. Then we organized the Belding Manufacturing Company, and I sold to them the property that I bought of Mr. Vail.

Q. 12. Has your company continued to manufacture and sell refrigerators since that date?

87 A. Yes.

Q. 13. State whether or not you have made any changes in the construction and arrangement of refrigerators since then.

A. I think we have made some slight changes, which we considered improvements. I think that the waste-pipe came down in front of the other refrigerator, and we moved them to the back, and we changed the outside case somewhat. The panels were originally nailed onto the stiles, and now we groove them in. The bottom of the ice-chamber was originally more of an incline towards the center than it is now, and inclines a trifle toward the back now, for the

water to run off. I don't know of any other special changes that we have made.

Q. 14. Do you know whether or not the Perfection refrigerators manufactured by the Booth & Osgood Manufacturing Company had been sold upon the market prior to the date of your purchase from Vail of that portion of the business?

A. Yes, sir, they have.

Q. 15. To what extent, if you know?

A. I cannot say. They had sold them; I should guess their sales were three or four thousand a year.

Q. 16. State whether or not your company found a market for these refrigerators in 1884–'5, and to what extent.

A. We sold nearly 4,000 refrigerators in 1884 and 1885.

Q. 17. Has your business increased since then, and to what extent?

A. We are selling; we will sell nearly four times that many this year.

88 Q. 18. State whether or not the Belding Manufacturing Company is equipped with facilities for supplying the *all* demands of the trade, and the public, for refrigerators of this class?

A. Yes, sir, I think we are. We have a very large factory just finished. I think we could make twice as many goods as we are now selling.

Q. 19. What was the capital stock of the Belding Manufacturing Company in 1884, when you say it was organized?

A. $25,000.

Q. 20. State whether or not your company has invested any considerable sum of money in the plant, tools, stock, etc., for the purpose of manufacturing and selling these goods.

A. Yes, sir, we have in the neighborhood of $175,000 *dollars* invested in it now.

Q. 21. How much attention do you give personally to the details of the refrigerator business?

A. I go to Michigan once or twice a month, and in the selling season I sell some goods in this city. I look after the salesmen and see what they are doing all of the time, but I do not give all of my time to it.

Q. 22. State whether or not you are generally familiar with refrigerators on the market, and their respective merits.

A. I am not an expert, but I have met several competitors in the market, and I know something about some of the refrigerators in the market. I think the New Perfection is the best one.

Q. 23. Name some of these competing refrigerators.

A. The Alaska, the Challenge Iceberg, the Baldwin, Jew-
89 etts; there are some others I have seen that I do not remember the names of.

Q. 24. Give your reasons for the statement that you regard the New Perfection refrigerator the best one on the market, stating as fully as you please.

A. In the first place I think it is the best manufactured, the most care taken in the construction. It has a good circulation, and is

finished better, particularly on the inside. Every one that uses one says it is the best refrigerator they ever used.

Q. 25. Do you use one yourself?

A. I use one myself, yes, sir, and have used one or two different makes before I got this. It does the best work for me, uses the least ice.

Q. 26. Have the refrigerators made by your company always been finished in light ash, as "Complainant's Exhibit Complainant's Refrigerator" here present?

A. They have until January, 1889, I think.

Q. 27. I hand you Complainant's Exhibit Belding's Catalogues 1885, 1886, 1887 and 1889, and ask you whether or not these catalogues were issued by the Belding Manufacturing Company on the dates respectively appearing upon each.

A. They were.

Q. 28. I call your attention to the printed testimonials in each of those catalogues save the 1875, and ask from what source the matter was obtained from which you printed said testimonials.

A. From letters received from the parties themselves.

Q. 29. State whether or not your company has received any complaints from the trade or from users relating to the working of your refrigerators.

90 A. They have not.

Q. 30. State whether or not, to your knowledge, the Challenge Corn Planter Company was, during the year 1884, manufacturing and selling refrigerators.

A. I do not think they were; at least I did not hear of it.

Q. 31. State when and how you first knew of the manufacture and sale of refrigerators by said Challenge Corn Planter Company.

A. I do not know that I can give the exact date. I think I heard of it in the spring of 1886. I then saw their goods on the market in this town.

Q. 32. Prior to that date, the spring of 1886, had your company sold any refrigerator or refrigerators to the Challenge Corn Planter Company or any of its officers? And, if so, state when, where and to whom.

A. In the fall of 1885, a man who represented himself to be the foreman of the Challenge Corn Planter Company, went to Belding, I think his name was Schofield, and bought a refrigerator, one of our regular No. 3 refrigerators, for his own use, and had it shipped to Grand Haven.

Q. 33. State whether or not a No. 3 refrigerator, made by your company in the fall of 1885, differed from the No. 3 refrigerator here in evidence as "Complainant's Exhibit Complainant's Refrigerator."

A. I do not think there was any material difference. There might have been in the trimmings, handle and lock.

Q. 34. State whether or not the trade of your company has been interfered with and damaged by the manufacture and sale of refrigerators by the Challenge Corn Planter Company.

91 A. I think it has, materially. They have been our strongest competitors for the last two years. Their prices have been lower than ours, and they represented their goods to be exactly like ours, and in a great many instances have made people believe they were like ours.

(Question and answer objected to as irrelevant and as without foundation in the knowledge of the witness, so far as appears from this testimony.)

Q. 35. State the reasons you have for the answer you gave to question 34. In other words, state how you know the fact to be as you have represented in that answer.

A. I know from the complaints made by our salesmen. In one instance, at Indianapolis, Hildebrand & Fugate, customers of ours, and have been for two or three years previous, had samples of the Challenge Refrigerator Company in their store this last winter; I cannot remember the date exactly, and told our salesman, Mr. Cutler, that the Challenge goods were exactly like ours, and the price was fifteen per cent. lower. We had to lower our price in order to hold the customer. I have had the same kinds of complaints made from our traveling men who were traveling in the east.

Q. 36. Examine Complainant's Exhibit Belding 1889 Catalogue, and Complainant's Exhibit Defendant's 1889 Catalogue, and designate two refrigerators therein illustrated which correspond with each other in relative size, and then point out the price, respectively, set opposite to these refrigerators.

(Question objected to as irrelevant and immaterial.)

A. No. 3, in Belding's refrigerator, and No. 9, in Challenge. The size is exactly the same and the price is exactly the same.

92 Q. 37. Are you familiar with refrigerators manufactured by the Challenge Corn Planter Company?

A. I have seen them and examined them pretty thoroughly.

Q. 38. Please examine "Complainant's Exhibit Defendant's Refrigerator No. 1," and state for the information of the court all the features of similarity or dissimilarity between the said exhibit and Complainant's Exhibit Complainant's Refrigerator.

A. Those refrigerators are alike with the exception that the warm-air flue in the Challenge refrigerator does not come quite as high as in the New Perfection. The center discharge of cold air is in the same place in both. I notice the partition between the two provision chambers does not come quite up to the ice-chamber in the Challenge. Aside from that, on the inside working I cannot see any difference, and that is very little difference.

Q. 39. How about the outside?

A. The outside of the two refrigerators is very similar in construction, except the finish and trimmings. The finish of the Challenge refrigerator is dark, and of the New Perfection it is light.

Q. 40. State whether or not, in your opinion, the construction and arrangement, taken in conjunction with the general outside appearance of these two refrigerators, are so similar that the average pur-

chaser of these goods, seeing them at different places, and without any mark or tag thereon to designate by whom they were manufactured, and giving such attention to the construction and general appearance of the said two exhibits as a purchaser usually gives, would be deceived by such similarity, and might thereby purchase the one thinking he was purchasing the other.

93 (Objected to as irrelevant and immaterial.)

A. They would, with the same finish and same trimmings. The interior construction would deceive any person.

Q. 41. Do you know of any instances where intending purchasers have been so deceived?

A. I cannot recall any, myself, personally.

Q. 42. State whether or not the customers of your company, or any of them, have at any time commented, either in person or in writing, to your company, upon any similarity between the goods of your company and those of the Challenge Corn Planter Company.

(Same objection as before.)

A. All of our traveling salesmen have reported to our company that their customers have said that the Challenge Corn Planter refrigerator and ours had the same circulation and were made of the same wood outside, and one should be as good as the other.

Q. 43. Were you personally acquainted with Richard T. Hambrook, the patentee?

A. I was.

Q. 44. Was he at any time connected with the Belding Manufacturing Company?

A. No, sir.

Q. 45. Do you know where he is?

A. He is dead.

Q. 46. When did he die, if you know?

A. He was killed in the spring or winter of 1887, at No. 234 Fifth avenue.

Q. 47. State whether or not the Belding Manufacturing Company at the time of the filing of the bill of complaint in this case, was possessed of the entire right, title and interest in the Hambrook patent here in evidence.

(Objected to as not the best evidence.)

94 A. It was.

Q. 48. Since the date of the assignment by yourself to the Belding Company of the entire interest in the said Hambrook patent, state whether or not the Belding Company has parted with any interest in said patent, by assignment or other conveyance.

A. They have not.

Q. 49. State whether or not your company has agents for the sale of its refrigerators in different parts of the country.

A. It has.

Q. 50. State whether or not the Belding Manufacturing Company, or any person authorized to act for it, has ever granted or issued

any license or permission to the Challenge Corn Planter Company to manufacture refrigerators under the said Hambrook patent.

A. They have not.

Cross-examination:

C. Q. 51. You have stated that you are familiar with the Alaska refrigerator. Please describe any differences between its construction and the construction of the Belding refrigerator, or "the New Perfection."

A. In the Alaska refrigerator the hot-air flue comes out between the inside shell and outside shell of the refrigerator; runs up through into the lid; then comes down from the center of the lid, on the ice, and until very lately the provision chamber has been dropped lower than the bottom of the door, so that the bottom of the provision chamber has not been flush with the door.

C. Q. 52. Aside from these differences, the construction of the two refrigerators is substantially the same, is it not?

95 A. I think it is substantially the same.

C. Q. 53. Is there any particular advantage, in your opinion, in having the hot-air flue or flues discharge at the top of the ends of the ice chamber over the discharge from the center of the top, as in the Alaska?

A. We think there is.

C. Q. 54. Do you know what patent the Alaska refrigerator is manufactured under?

A. I am not positive; I think it is Smith's.

C. Q. 55. Isn't this the patent?

A. I think it is. (Said patent being No. 193,563, granted G. F. Smith, July 24, 1877.)

C. Q. 56. Then the location of the hot-air flues constitutes the only substantial difference between the New Perfection and the Alaska?

(Counsel for complainant objects to the question, as calling for the opinion of a patent expert, when the witness has not qualified as such, but has, on the contrary, in his answer to question 22, stated: "I am not an expert.")

(Counsel for defendant replies that the question is confined to the mechanical construction of the two refrigerators, without any reference to any patent.)

A. I think there is a good many differences. I think our refrigerator is made a good deal better than the Alaska.

C. Q. 57. Does not the novelty or invention found in the New Perfection consist in the discharge of the hot air at the top of the ends of the ice-chest?

(Last objection repeated.)

A. I do not know; I am not expert enough to tell.

C. Q. 58. When the Hambrook refrigerator was made

96 by the Booth and Osgood Company, it was constructed like the cut on page 5 of their catalogue, was it not?

A. I do not know.

C. Q. 59. Is there any material difference between the style and finish and outside appearance of the Alaska refrigerator and the New Perfection?

A. The style of the architecture is not the same between the Alaska, the New Perfection, and the Challenge. The style of architecture is entirely different from the New Perfection and the Challenge.

C. Q. 60. Does the Belding Company ever sell refrigerators without their name and the trade name "New Perfection" marked on them?

A. They do.

C. Q. 61. Do you know personally of the purchase of one of the complainant's refrigerators by a party representing himself to be a representative of the Challenge Corn Planter Company, or is your knowledge derived from information imparted to you by some one else?

A. I am president of the company, and when I am at Belding I inquired who they were selling goods to, and they mentioned, both Mr. Ranney and Mr. Lewis mentioned the fact of selling a refrigerator to the foreman of the Challenge Corn Planter Company, and I think they said his name was Schofield.

C. Q. 62. You say in answer 34 that "they" (the defendants) "represented their goods to be exactly like ours." Do you know of your personal knowledge of any instance of this being done?

A. Only from the say-so of my salesman. The instance at Indianapolis, I was consulted with before we closed the trade, whether we would close it or not, but I was not at Indianapolis.

97 C. Q. 63. You don't know then whether the representation made by the defendant was not simply that its refrigerator was just as good as the complainant's?

A. I was told that it was exactly like ours.

C. Q. 64. This statement was made by a party to whom you wished to sell your goods, was it not?

A. Yes, sir.

Redirect examination:

R. D. Q. 65. What style of refrigerators does your company sell, upon which it does not place its name and mark "New Perfection"?

A. We sell a refrigerator with a different style of case, different outside case, and without being filled with charcoal.

R. D. Q. 66. How many different concerns do you thus sell?

A. Two or three.

R. D. Q. 67. Do you know whether or not the books of your company contain any memorandum of the sale to the foreman of the Challenge Corn Planter Company, about which you have testified?

A. I do not; I think it was a cash sale; but still I think there is some memorandum somewhere.

HIRAM H. BELDING.

98 And thereupon, JAMES W. NYE, a witness produced on behalf of the complainant, being first duly sworn, deposes and says, in answer to interrogatories propounded to him by T. E. BROWN, counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. James W. Nye; age, forty-one years; residence, Chicago, Illinois, and occupation, salesman, Hibbard, Spencer, Bartlett & Company.

Q. 2. Is it a part of your occupation to sell refrigerators; and if so, to what extent have you been thus occupied?

A. It is a part of my regular business to sell refrigerators. I pay special attention to it; I sell more than any man in the establishment.

Q. 3. Are you generally familiar with the different refrigerators upon the market?

A. I am.

Q. 4. How long have you been engaged in selling refrigerators?

A. Ever since my connection with Hibbard, Spencer, Bartlett & Co.—April 14, 1870.

Q. 5. Please look at the three refrigerators here present, marked respectively, "Complainant's Exhibit Complainant's Refrigerator." "Complainant's Exhibit Defendant's Refrigerators, Nos. 1 and 2," and state whether or not you have ever seen these refrigerators before?

A. I have ones similar to them.

Q. 6. Have you ever sold any refrigerators manufactured by the Belding Manufacturing Company; and if so, since when?

99 A. I have sold the Belding Company's refrigerators ever since they were put in stock by our firm, six years ago.

Q. 7. When did you first become acquainted with the refrigerator known as "The Iceberg," and manufactured by the Challenge Corn Planter Company?

A. I saw them first at the store of L. M. Brown, 3201 State street. I think this was three years ago.

Q. 8. In selling the Belding Company's refrigerator, have you found the Iceberg refrigerator a competitor in the market, and if so, to what extent?

A. It has been a very serious competitor in my territory, which is the city of Chicago.

Q. 9. In what way?

A. It is the same refrigerator as the Belding Company's, and is sold at a less price to the retail dealers.

Q. 10. How did the Challenge Company refrigerator, which you saw about three years ago, compare with the exhibit here present, marked "Complainant's Exhibit Complainant's Refrigerator," in its arrangement, construction and general appearance?

A. The Challenge refrigerator was the exact duplicate of the Belding Company's refrigerator, as made at that time.

Q. 11. Please examine again "Complainant's Exhibit Defendant's

Refrigerator No. 1," and "Complainant's Exhibit Complainant's Refrigerator," and point out for the information of the court, the general features of similarity or dissimilarity between the two exhibits.

A. The internal arrangement is exactly the same—for example, the cold air is admitted to the provision chamber in exactly the same way and place in the Iceberg refrigerator that it is in
100 the Belding refrigerator. There is the same strip of zinc on the bottom of the ice-rest in the Iceberg refrigerator to prevent drip from condensation into the provision chamber, that there is in the Belding refrigerator; the ice-rest of corrugated iron in the ice-chamber of the Challenge refrigerator is corrugated in the same way, and supported upon wood strips in the same way, in the Iceberg refrigerator, as in the Belding refrigerator. The doors in the provision chamber in the Iceberg refrigerator open clear to the bottom of the provision chamber, in exactly the same way that they do in the Belding refrigerator. I have never seen refrigerator doors open in this way in a refrigerator, excepting in the Belding Brothers' refrigerator, until I saw them in the Iceberg refrigerator. The flues for the hot air to rise from the provision chamber of the Iceberg refrigerator to the ice-chamber in the same refrigerator, are exactly the same in the Iceberg that they are in the Belding Brothers' refrigerator; the zinc is put onto the covering of the hot-air flue, in the Iceberg, in the same way that it is in the Belding refrigerator. The support for holding the lid open in the Iceberg refrigerator is exactly the same as in the Belding Brothers' refrigerator; the Belding Brothers put on this support to the lid of their refrigerators at my special request. As the Iceberg refrigerators were first shown to me, the arrangement of their doors to the provision chamber, in the smaller sizes of refrigerators having two doors, was exactly the same as in the Belding Brothers' refrigerators; there was no parting strip between the doors; up to the time that I saw double-door Iceberg refrigerators without a parting strip I had never seen any refrigerators made in that way, excepting Belding Brothers'. The way in which the corners of the Iceberg
101 refrigerators are built is exactly the same as the way that the corners of the Belding Brothers' refrigerators are built. This way of building prevents knocking the feet off the refrigerator, in handling it. These points of similarity between the two refrigerators, which I have specified above, were, to the best of my knowledge, the special peculiarities of the Belding refrigerator up to the time that I first saw the Iceberg refrigerator, and they were the points upon which I relied to sell the Belding refrigerators.

Q. 12. State whether or not the Corn Planter Company Iceberg refrigerators are so similar to the Belding refrigerators in their construction and appearance that, in your opinion, as a salesman, intending purchasers of these goods, giving such attention thereto as the average and ordinary purchaser usually gives, would be misled by any such similarities, and might thereby purchase the one supposing it to be the other refrigerator, assuming of course that there be no tag or plate on either bearing the name of the manufacturer.

(Objected to as irrelevant and immaterial.)

A. As the Iceberg refrigerators were originally put on the market in this city, it was in no respect different from the Belding Brothers, excepting in the name plate, and possibly the knobs on the doors of the provision chamber. The sizes of the refrigerators were identical. I do not know of any other two makes of refrigerators in which the outside measurements are identical, excepting in the Iceberg and the Belding Brothers. Customers of mine, who had been buying the Belding Brothers' refrigerator of me for years, placed their orders with the makers of the Iceberg refrigerator, because, they told me, that they obtained the same refrigerator of the Iceberg people that I had been selling them, and got the Iceberg refrigerators
102 for less money than they had been getting Belding Brothers' refrigerators of me. As I remember the catalogues and printing matter sent to the dealers with the Iceberg refrigerator, the cuts and description and price-list of the Iceberg refrigerator, was the duplicate of the Belding Brothers' refrigerator. In speaking of the cuts, I do not refer to the pictures upon the outside of their catalogue or list sheets, but refer to the cuts showing the arrangement of the refrigerator, to the description and measurement of each size of the refrigerator, and to the directions for running it. The refrigerators were so exactly alike that customers of mine who had been buying Belding Brothers' refrigerators, and whose assortment of sizes was broken, bought Iceberg refrigerators of the sizes needed to complete their assortment, put the Icebergs on the floor side by side with the Belding Brothers, and sold them to the trade as one make of refrigerator. I have been told by my customers that the difference was never perceived by buyers.

Q. 13. If the name plates upon these refrigerators, or other marks designating the respective manufacturers, were removed therefrom, state whether or not, in your opinion, intending purchasers would be deceived by any similarities into the belief that both of said refrigerators, to wit, the Belding Company's and the Challenge Company's refrigerators might have been manufactured at one and the same factory.

(Same objection.)

A. If the name plates had been changed on these two refrigerators, the workmen in the factory couldn't have told which refrigerator came from which factory.

103 Cross-examination:

C. Q. 14. You are familiar with and understand the cuts used by the various refrigerator manufacturers to illustrate the construction and interior arrangement of their refrigerators, are you not?

A. I am reasonably well acquainted with the description and cut of refrigerators sold in this market.

C. Q. 15. You understand the construction illustrated on page 8, of the Challenge Company's catalogue, and on page 5 of the Belding Manufacturing Company's catalogue, of 1885, do you not?

A. Yes, sir; I am familiar.

C. Q. 16. I now show you another cut showing the interior arrangement of the refrigerator, and ask you if you understand that, and the object and purpose of the deflector marked "K."

A. I think that I do understand the object of the deflector marked "K," and also the construction of the refrigerator.

C. Q. 17. Is the construction and arrangement shown in this cut the same as that shown in the two cuts first referred to?

A. The arrangement of the air flues is practically the same. The ice-rest in this last cut is different. The deflector marked "K" is not similar ("in shape," see C. Q. 20), to anything in either of the cuts first shown me; the bottom of the ice-chamber in the last cut shown me, and the arrangement for getting rid of the drip, and the ice-rest, are different from articles used for the same purpose in the first two cuts shown me; also, the last cut shown me does not appear to be a filled refrigerator. The first two cuts shown me are filled.

104 C. Q. 18. I will now ask you whether you find in either of the first two cuts shown you, the parts in the last cut shown you which I will name by letter, (1). Do you find the ice-chamber C having rack c', and double-inclined bottom pieces x and y.

(Counsel for complainant objects to this question, as well as to the last preceding question and answer, as calling for the opinion of a person skilled in the critical examination of different drawings, and also as calling for the opinion of a patent expert, when the witness has not qualified as such, or even as a skilled draftsman. Questions and answers are also objected to as incompetent, irrelevant and immaterial.)

(Counsel for defendant replies that the witness has shown himself abundantly qualified to compare these very simple drawings relating to an art he is familiar with.)

A. I find that the ice-rack in the cut last shown me, is apparently of wood, while the ice-rack in the first two cuts shown me is apparently of metal. That is the difference that I see between the ice-racks. The pieces x and y are apparently at a little different angle in reference to the sides of the provision chamber then are the pieces which represent the top of the provision chamber in the cuts first shown me.

C. Q. 19. Do you find in the first two cuts shown you the deflector plate "K" shown in the last cut?

(Last objection repeated.)

A. If the cuts first shown me are intended to represent the interior arrangement of the Iceberg, and the Belding Brothers' refrigerator, I do not think that the cuts exactly show the
105 construction. There is not, in the cut shown first, anything to prevent drip into the provision chamber from condensation. The last cut shown me is not such a cut as is ever found in a trade circular. Trade circulars, so far as I am acquainted with them, are not as technical as the cut last shown me.

C. Q. 20. Do you find in either of the cuts first shown you, or is there, in the Belding Manufacturing Company's refrigerator, or the Challenge Corn Planter Company's refrigerator, either the deflector plate "K" or the trough *z*?

(Last objection repeated.)

A. I would like to amend my answer to cross-question 17. I would say the ice-rest in this last cut seems of different material from those in the first two. I wish to insert in line 3, after "similar," the words "in shape."

In answer to the last question I will say that I know that there is in the Belding Brothers' and the Iceberg refrigerator a strip of zinc underneath the ice-rest, and over the entrance to the provision chamber, designed to prevent drip into the provision chamber, which I believe to be the object of the deflector marked "K."

C. Q. 21. Assuming that to be correct, the question is simply whether the construction is the same in the cuts first shown you, as in the cut last shown you?

(Last objection repeated.)

A. I have already stated that the cut in the Belding Brothers' catalogue and in the Challenge Corn Planter's catalogue is exactly the same, and that the arrangement of the flues to secure the circulation of air is the same in the last cut as in the first two shown me.

C. Q. 22. Are the cuts first shown you and the cut last
106 shown you alike in any other respect than the arrangement of the flues?

A. The whole plan for the circulation of air and avoiding drip in these three cuts are identical.

C. Q. 23. Is there, in either of the first two cuts, the curved deflector K?

(Last objection repeated.)

A. The first two cuts do not represent the refrigerator as they are put upon the market. There is in each refrigerator, as put on the market, the exact equivalent of the deflector K, whether it is bent at precisely the same angle would require nice mathematical engineering instruments to determine.

C. Q. 24. When this last cut was first shown you, you did not know that it was the drawing of the Hambrook patent, did you?

A. I do not know it now.

C. Q. 25. Have either of the refrigerators, before referred to, the troughs marked "*z*" in that drawing?

(Last objection repeated.)

A. To answer that in reference to the refrigerators as put upon the market, would require very exact measurements, which I am not expert enough to make.

C. Q. 26. How do the first two cuts shown you differ from the refrigerators they are intended to illustrate? I refer only to the internal construction for directing and controlling the air currents and the drip?

A. In the two cuts first shown me the arrangement for controlling the air currents seems to me identical, and in this respect the cuts represent the two refrigerators with reasonable accuracy. Both cuts omit to show any arrangement to prevent the drip into the provision chamber of moisture condensed underneath the ice-rest.

107 Both cuts, as I stated before, differ from the technical drawing shown me last. It is not usual in trade circulars to make such technical drawings, as the last cut.

C. Q. 27. Is there, in either of the refrigerators in controversy, any arrangement to prevent the drip into the provision chambers of moisture condensed underneath the ice-rest?

A. There is such a device in both refrigerators.

C. Q. 28. Describe it.

A. It is the equivalent of the deflector "K" in the cut last shown me. A strip of non-conducting metal wider than the entrance from the air chamber into the provision chamber, and placed underneath the ice-rest, directly over the entrance from the air chamber to the provision chamber.

C. Q. 29. I understand now that you refer to the strip of zinc over the opening into the provision chamber, through which the cold air passes down; said strip being close against the galvanized-iron bottom upon which the ice-rests?

A. I have all along been attempting to describe to you the device used in both refrigerators to prevent any drip into the provision chamber. This is accomplished by this piece of zinc referred to.

C. Q. 30. The strip of zinc which you have been referring to as the deflector, in the two refrigerators, is designed to catch the moisture caused by condensation from the air, is it not?

A. It is designed to prevent condensation in that particular spot, to as great a degree as possible, and I should judge, if condensation did occur in that particular spot, the drip would follow the zinc plate to its edge, and drop to the bottom of the ice-chamber

108 at a point beyond the opening from the air chamber into the provision chamber.

C. Q. 31. This strip is not designed, and from its location, is incapable of, catching water produced by the melting of the ice falling upon it from above, is it not?

(Question objected to as incompetent, and as calling for the evidence of an expert when the witness is not qualified.)

A. No, sir; it is not impossible for it to catch moisture in this way.

C. Q. 32. Then it is this strip which you consider the equivalent of the deflector K?

A. How nearly this strip corresponds to the deflector marked "K" in the cut last shown me, could only be ascertained by exact measurement. It is my experience that in manufacturing goods workmen hardly ever work exactly to a drawing. I should say that there was in each of these two refrigerators, what in practical use is the equivalent of the small trough marked *z* in the cut last shown me.

C. Q. 33. You say in answer 23, "There is in each refrigerator, as put on the market, the exact equivalent of the deflector K." Now my question is, whether it is this strip of zinc that you referred to as this equivalent?

A. It certainly, in my judgment, does exactly the work designed to be done by the deflector marked K in the cut shown me.

Redirect:

R. D. Q. 34. I call your attention to the last sentence in your answer to C. Q. 32, and ask you to state more definitely the portion of the refrigerators therein referred to?

A. In each of the refrigerators shown here in this office,
109 which I have this moment carefully examined, the way in which the zinc is turned up about the entrance from the ice-chamber into the provision chamber, and the slight pitch given to it, serves to convey drip to the drip pipe, in exactly the same way which I should suppose the troughs marked *z*, in the cut last shown me would do it. That is exactly what I referred to in my answer to C. Q. 32.

Recross:

R. C. Q. 35. I now show you the cut of patent No. 62643, and call your attention to the part marked "F," and ask you whether that will not catch the drip and carry it off, in substantially the same way as in the refrigerators in controversy?

(Question objected to as calling for a comparison by the witness of letters patent which he has not heretofore examined, and upon which he has not qualified upon this record as being capable of examining and determining upon this question, and, further, as being incompetent and entirely improper upon cross-examination.)

Counsel for defendant suggests that if the witness does not understand the drawings, he can read the accompanying description.

(Counsel for complainant still protests against the question because calling for the opinion of a patent expert when the witness has not qualified as such.)

A. If the part marked "G" in the picture shown me last, is made of metal or covered with metal, it would not, in my opinion, prevent the drip in the provision chamber.

R. C. Q. 36. Why not?

A. Because every time the provision-chamber doors were
110 open, the warm air which would necessarily enter would deposit its moisture on the plate F, and would drip down. This construction is different, in my opinion, from the way either the Belding or the Iceberg refrigerators are built.

R. C. Q. 37. Wouldn't the part F catch all the water caused by the melting of the ice in the ice-chamber?

(Last objection repeated.)

A. That could be best told by practical experiment.

R. C. Q. 38. I ask you the same question with respect to the part *k*, in patent No. 77624?

(Last objection repeated.)

A. I don't know its object.

JAMES W. NYE.

By agreement of counsel, the further taking of testimony is adjourned until Tuesday, June 11, 1889, at ten o'clock, a. m.

TUESDAY, *June* 11, *A. D.* 1889—ten o'clock, a. m.

Met pursuant to adjournment.
Present as before.

At the request of counsel for complainant, counsel for defendant hereby admits that prior to the filing of the bill of complaint in this cause, the defendant, The Challenge Corn Planter Company, had manufactured and sold the two refrigerators here in evidence and marked "Complainant's Exhibit Defendant's Refrigerators Nos. 1 and 2," respectively, and have manufactured and sold other refrigerators substantially identical with said exhibits.

Counsel for defendant also admits that the catalogue marked "Complainant's Exhibit Defendant's 1889 Catalogue," is the catalogue for that year of The Challenge Corn Planter Company, the defendant herein.

111 And thereupon, FRED. E. RANNEY, being first duly sworn, in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, testifies as follows:

Q. 1. What is your name, age, residence and occupation?

A. Fred. E. Ranney; age, 35 years; residence Belding, Michigan; and occupation, I am vice-president and general manager of the Belding Manufacturing Company.

Q. 2. How long have you been connected with that company?

A. Since its organization in 1884; I think about in September or October, 1884.

Q. 3. How much attention do you give to the details of the business?

A. I have given my whole time and attention since I commenced with the company, upon its first organization.

Q. 4. Where is the factory of the company, and state whether or not you spend all or any portion of your time there?

A. The factory is at Belding, Michigan; the larger part of my time is spent at the factory. However, I am called away a few days at a time, in looking after the lumber interests, and also the sales in certain places.

Q. 5. Do you know any person by the name of Levi Schofield, connected with the Challenge Corn Planter Company; and if so, state when you met any such person?

A. I met a gentleman some time in July or August, I think, of

1885. At least it was during the temporary shut-down after
112 the end of our manufacturing season. The gentleman came to our place and introduced himself as Levi Schofield, superintendent of the Challenge Corn Planter's works, at Grand Haven, Michigan.

Q. 6. What do you mean by the words "our place" used in your last answer?

A. Our office at Belding.

Q. 7. If you had any conversation with Mr. Schofield at that time, state what it was, and all the circumstances connected with his visit to your office?

A. He came to our office and requested us to let him go through the factory, which we did. I was with him a part of the time while in the factory. During his stay there he asked me several questions regarding the details and profits of the business; he examined quite thoroughly a great many of the wood-working machines. During our conversation he stated that he wished to buy a refrigerator for his own personal use in his house, and asked for an illustrated catalogue, which we gave him. In the course of his conversation I asked Mr. Schofield some questions about the manufacture of his corn-planters. I asked him if he manufactured any other goods excepting in that particular line, and he said he did not. During his stay there I became suspicious that he was there for the purpose of learning what points he could draw out of us, and, possibly he might enter into the manufacture of refrigerators. Consequently, I asked him in particular, if he contemplated manufacturing refrigerators. His answer was something like this: That their company had contemplated manufacturing a refrigerator which, at that time, was being contested as an infringement upon some other refrigerator, and he also further stated that he had given up the idea of manufacturing refrigerators, as he did not wish to buy a lawsuit, or words to that effect.
113 Later on, during the season, while I was away from the office and factory, Mr. Schofield returned to Belding and came to our office and purchased a refrigerator from our bookkeeper, stating that he had studied the sizes well and had concluded that our No. 3 was the size that he wanted. On my return home I found an entry made on our cash book: "Nov. 11, 1885, Levi Schofield, one refrigerator, $20." I also have in my hand a shipping receipt, dated "Belding, Michigan, Nov. 11, 1885, received from the Belding Manufacturing Company, one refrigerator, weight 300 pounds" marked "Levi Schofield, Grand Haven," and signed "O. F. Webster," agent of the Detroit, Lansing and Northern Railroad Company. I wish to state that this receipt is a duplicate, the original receipt having been sent with the invoice to Levi Schofield. Consequently we cannot procure the original receipt unless Mr. Schofield chooses to produce it.

Q. 8. How long was Mr. Schofield at your office and factory, in July or August, 1885?

A. As near as I can recollect, he spent the entire time after dinner, until the afternoon train left, the train that he took. There

was a horse car running at this time from Belding to Kiddville. Our office being beside the railroad track, he remained there until the car came along, taking the car from our office. It was at least three hours that he was there.

Q. 9. What catalogue did you give him at that time?

A. I gave him the first catalogue that was issued. That being the end of our first year's business, we had no other catalogue to give him except our first one.

Q. 10. Is the Mr. Schofield whom you met at that time at Belding, the same gentlemen here present?

114 A. Yes; he is the same one.

Q. 11. State whether or not it is the usual custom of the Belding Manufacturing Company for some employé of their company, designated for the purpose, to mark or place upon the refrigerators manufactured by the Belding Company, any word or numerals, designating any patent or patents under which its refrigerators are made?

A. When the goods are packed, they are stenciled on the back in the following words: "Manufactured by the Belding Company, Belding, Michigan." Underneath the stencil is a line stating the date of the patent, which reads: "Patented May 28, 1878."

Q. 12. State whether or not the goods of your company have always been so marked?

A. I think it is quite probable that some goods were sent out the first year without the patent mark. Our attention was called to it by our president soon after we began to make goods, since which time they have all been marked that way.

Q. 13. Do you know whether or not your refrigerators were marked "patented" at the date of the sale to Mr. Schofield, in November, 1885?

A. They were.

Q. 14. At that time, November, 1885, had you seen, or did you know of a refrigerator called "the Challenge Iceberg," and if not, state when you first knew anything concerning said refrigerators?

A. I had not heard of such a refrigerator at that time, called "the Challenge Iceberg." The first I heard of that Challenge refrigerator was the following winter and spring.

Q. 15. If you have any personal knowledge of the operation

115 and the advantages of the refrigerator manufactured by the Belding Company, please state your information?

A. The advantages I claim are its internal construction, and cold-air circulation, which I consider the best of any refrigerator in the market at the time of our first commencing to manufacture the goods.

I know personally that I have used the refrigerator of our manufacture, and know it to be all it is represented to be. I have never used any other refrigerator in my house, and could not state personally of its advantages except the comments and praise our refrigerators has had by other users, as compared with other makes.

Q. 16. How long have you had a Belding refrigerator in use at your house?

A. This is the fifth season, I think, possibly the fourth, but I think it is the fifth.

Q. 17. Is that refrigerator made like the refrigerator here present, marked "Complainant's Exhibit Complainant's Refrigerator"?

A. It is made like that refrigerator there, yes, sir.

Q. 18. State whether or not in the refrigerator which you have in your house, you have found at any time water collecting upon the plate of zinc, which is located between the wooden supports and the ice-rack, which water would drop down through the opening to the bottom of the ice-chamber, and into the provision chamber or chambers.

A. Water sometimes collects on this deflecting plate or piece of zinc, but it runs off at the edges, dropping into the ice-chamber, and not into the provision chamber.

Counsel for complainant offers in evidence the duplicate railroad receipt referred to by the witness in his answer to interrogatory 7, and the same is identified with this record as "Complainant's Exhibit Schofield Shipping Receipt."

116 Q. 19. Have you before this morning seen the two exhibit refrigerators here present, and marked respectively "Complainant's Exhibit Defendant's Refrigerators Nos. 1 and 2"?

A. I have never seen those refrigerators that I know of, before this morning.

Q. 20. Please examine them, and state whether or not, in your opinion, the internal arrangement and construction resembles or differs from the Belding refrigerators.

A. I find them practically the same in their internal construction.

Q. 21. Have you ever testified before in a patent suit?

A. No, I never have.

Cross-examination:

C. Q. 22. The object of this narrow plate or sheet of zinc on the under side of the ice-rack, and immediately over the opening in the top of the provision chamber, is to prevent the warm air, especially when the provision-chamber doors are open, from striking the bottom of the ice-rack, which is, of course, very cold from the immediate contact with the ice, and prevent condensation of the moisture in this warm air, which, without this plate, might drop into the provision chamber, is it not?

A. Yes, that is one object of the sheet of zinc; in fact, that is the main object.

C. Q. 23. What moisture collects on it from condensation, collects principally on the under side, does it not?

A. It collects on the upper side, and in some cases on the lower side.

117 C. Q. 24. This plate catches moisture or drip caused by condensation, does it not? and not the drip caused by the

melting of the ice which flows over the edges of the ice-rack; is that correct?

A. If there should be no leaks or defects in the corrugated iron, there would probably be no necessity of catching the melted ice-water; but, as is often the case, the corrugated iron is put on in two or more pieces, bringing the joint of the two pieces of iron, in some cases, directly over this sheet of zinc; then, of course, the zinc prevents the water dripping into the provision chamber.

C. Q. 25. Did you ever see one of the defendant's refrigerators constructed in this way?

A. I cannot say that I have ever seen one of theirs constructed in this way.

FRED. E. RANNEY.

And thereupon WILLIAM A. STANTON, being first duly sworn, in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, testifies as follows:

Q. 1. What is your name, age, residence and occupation?

A. William A. Stanton; age, forty-five years; residence, Chicago, Illinois; and occupation, I am stockholder and treasurer of the Belding Manufacturing Company.

Q. 2. State when the Belding Company was organized; the amount of its capital stock; whether or not that amount has been changed; and if so, to what extent.

A. Our charter is dated the 27th of October, 1884. We started with a capital of twenty-five thousand dollars, which was afterwards increased to thirty, then to fifty, and then to one hundred thousand dollars.

118 Q. 3. What is the business of the Belding Manufacturing Company, at the time of, and since its organization?

A. Manufacturing refrigerators under the Hambrook patent.

Q. 4. Prior to the organization of the Belding Manufacturing Company, state what knowledge you had had of refrigerators and the refrigerator business?

A. On the 14th of November, 1883, I was appointed receiver of the Booth & Osgood Manufacturing Company, of this city and Belding, Michigan, who were manufacturers of refrigerators, school and office furniture. Under an order of the court, I continued the manufacture of these goods for about ten months. On the 5th of August, I think it was, 1884, I got an order of the court to sell the business of the Booth & Osgood Manufacturing Company, and made the sale to one James W. Vail, I think it was on the 16th of August, of that same year. The sale was confirmed by the court on the 24th of October, of the same year. The Booth & Osgood Manufacturing Company were successors to the R. T. Hambrook Manufacturing Company, and were owners of the patents issued to R. T. Hambrook, for improvements in refrigerators. In making the sale to James W. Vail, as receiver, I sold him these patents.

Q. 5. What refrigerator did you manufacture during the time of your receivership; and state whether or not the same differed from the refrigerators now manufactured by the Belding Company.

A. I manufactured the Hambrook patent refrigerator, and in the interior workings it was practically the same as the refrigerator now manufactured by the Belding Manufacturing Company.

119 Q. 26. Please look at the printed book I now hand you, and if you can identify the same, do so.

A. This is a catalogue of the refrigerators issued by me when I was receiver of the Booth & Osgood Manufacturing Company.

Counsel for complainant offers the said catalogue in evidence, and identifies the same with his record as "Complainant's Exhibit Booth & Osgood, 1884, Catalogue."

Q. 7. State whether or not, prior to your sale to Vail, you had any knowledge of the manufacture and sale of the Challenge Iceberg refrigerator, and if not, then state when you first learned of such article, and by whom it was made.

A. Previous to, and at the time of the sale to James W. Vail, I had no knowledge of any refrigerator being manufactured under the name of the Challenge Iceberg refrigerator. The first I ever heard of the Challenge Iceberg refrigerator was in the spring of 1886.

Q. 8. State whether or not your company has facilities for supplying the demands of the public and the trade for refrigerators, such as you manufacture.

A. We have facilities for supplying the trade with refrigerators such as we manufacture, and have a capacity of about thirty-five thousand refrigerators per year.

Q. 9. What was the number of refrigerators you sold as receiver? And also state whether or not the sales of the Belding Company have increased since that date.

A. I cannot tell exactly how many refrigerators I sold as receiver, but think it was about sixteen hundred. The first year after the organization of the Belding Company, we sold about four thousand refrigerators. Last year we sold something over twelve thousand.

120 Q. 10. Did you receive a consideration for the sale of the Hambrook patent to Mr. Vail?

A. Yes, sir; I did.

Q. 11. Has your company received from its customers any complaints to the effect that there were other refrigerators upon the market which resembled the Belding refrigerator? If so, state fully your personal knowledge of this matter.

A. We have had numerous complaints from our customers that they could buy the Challenge Corn Planter Company's refrigerators, which were exactly like ours, at much lower prices. Our traveling men have made complaints to us that their customers were offered the Challenge Corn Planter Company's refrigerators at much lower prices, and that they were represented by the agents of the Challenge Corn Planter Company to be the same refrigerater as that manufactured by us. We came very near losing the largest customer we have on account of lower prices being made them by the Challenge Corn Planter Company. Our customers told us they

could see no difference in the goods. I have had customers of ours tell me personally, that they had put our goods side by side with those of the Challenge Corn Planter Company's, and that they could see no difference in them, and that the general public would buy one as soon as they would the other.

(Question and answer objected to as irrelevant and immaterial, and on the ground of hearsay evidence.)

Q. 12. If you are personally acquainted with the construction of the defendant company's refrigerators, state whether or not the same appear to you to be substantial copies of the refrigerators manufactured by your company.

121 A. I have examined several of the defendant company's refrigerators and find them substantially the same as those manufactured by our company; in fact, they are so near alike that it is very hard to tell one from the other, if the name plates are left off.

Q. 13. Since acquiring its title to the Hambrook patent, has the Belden Company, to your knowledge, parted with its title, or any interest in said patent, by assignment or otherwise?

A. It has not.

Q. 14. Have you any Belding refrigerators at your house; and if so, state how long you have used it?

A. The refrigerator that I have in use in my house is one made during the time I was managing the business of the Booth and Osgood Company as receiver, and is the same as those now manufactured by the Belding Manufacturing Company. It has been in use a little over five years.

Q. 15. Have you ever used any other make of refrigerator?

A. Yes, sir, I have.

Q. 16. State any advantages which you have observed in the refrigerator now in use at your house, and in doing so, you may, if you choose, compare the same with other refrigerators that you have used?

A. I have observed in my refrigerator that it preserves the original flavor of fruits and vegetables, butter, milk, etc.; that it is more economical in the use of ice than other refrigerators I have used; that the air is cool and dry, and the provision chambers are free from moisture.

Q. 17. Are you a mechanic, Mr. Stanton?

A. No, sir; I am not.

122 Q. 18. Do you consider yourself sufficiently well posted in mechanical construction of refrigerators generally to justify your being called an expert in such matters?

A. No, sir; I do not consider that I am an expert.

Cross-examination:

C. Q. 19. What is the name of the customer whom you referred to as being one of your largest customers, whom you almost lost by reason of the competition of the defendant?

A. The name of the customer is Hibbard, Spencer, Bartlett & Company, of Chicago.

C. Q. 20. Hildebrand & Fugate, of Indianapolis, are still customers of yours, are they not?

A. Yes, sir, they are; but we were obliged to lower our prices very much in order to hold them.

C. Q. 21. Was the increase of stock of the complainant company paid for in cash, or does it represent the increase of value by reason of the profits of the business?

(Objected to as incompetent, irrelevant and immaterial.)

A. I decline to answer that question.

(Witness having testified on direct examination to the increase of the capital stock of the complainant company, the defendant here gives notice that it will move to have the testimony-in-chief stricken out unless the last question is answered.)

C. Q. 22. Do you still decline to answer the last question?

A. Yes, sir.

C. Q. 23. About what, in your opinion, based upon your knowledge of the business, is the total number of refrigerators sold per annum in the United States?

123 A. I have never investigated the matter, and therefore could not give any figures with regard to the number sold.

C. Q. 24. The Alaska and the Leonard Company each sell more refrigerators than the complainant, do they not?

(Objected to as incompetent, irrelevant and immaterial.)

A. I am of the opinion that the Alaska Company sell more refrigerators than we do; but the Leonard Company do not sell one-half as many as we do.

C. Q. 25. What consideration was paid by Mr. Vail for the Hambrook patent?

A. When I made the sale to Mr. Vail the property in my hands as receiver was all sold in bulk; no bill of items being given. The amount of the whole sale, including the patent, was eight thousand dollars.

C. Q. 26. Was any estimate made of the value of these patents?

A. There was no estimate made or any figures given upon any one article.

C. Q. 27. Wasn't an inventory filed by you as receiver, in the court?

A. Yes, sir.

C. Q. 28. Wasn't the patent included in that inventory?

A. At the time I made this sale to Mr. Vail, I don't think any inventory had been filed at that time. I asked for an order of the court to sell the assets in my hand, as receiver; the order was granted and the sale was made in bulk, without any inventory being furnished. I advertised under order of the court.

124 C. Q. 29. In the inventory that was filed in court, valuations were placed upon the various items, were they not?

(Question objected to as wholly irrelevant, immaterial and im-

proper, and as secondary evidence, the inventory itself or a certified copy of the same being the best evidence.)

A. I believe there was.

C. Q. 30. Do you remember what valuation was placed upon this patent?

A. I do not.

C. Q. 31. Was it mentioned in the advertisement for the sale of the assets?

A. I do not remember what the advertisement was, and whether it specified any particular item that would be sold, except that I would sell the property in my hands as receiver of the Booth & Osgood Company.

C. Q. 32. Wasn't there any appraisals?

A. No, sir; there was not.

C. Q. 33. Was the patent mentioned at all in the inventory which you filed in court?

A. I could not say as to that; the inventory will show.

C. Q. 34. Will you produce a copy of the inventory?

A. I haven't any copy.

C. Q. 35. Will you get one from the files of the court?

A. If you desire a copy you will have to get one from the court.

C. Q. 36. What court was this matter pending in?

A. In the superior court of Cook county, Illinois.

Redirect:

R. D. Q. 37. State whether or not, after the sale to Mr. Vail, you made an application to the court petitioning for an order for
125 authority to make a proper and sufficient assignment of the Hambrook patent, and whether or not in this petition you said: "That the said letters patent were not specifically mentioned in the said order of sale nor the report thereof, which was approved by this court on the 24th day of October, 1884, although they were included in the said sale and the said purchase price of eight thousand dollars?"

A. I did.

R. D. Q. 38. Did you obtain an order of court, as prayed for?

A. Yes, sir; I did.

R. D. Q. 39. And, in pursuance thereof, did you afterwards execute the assignment to James W. Vail, which I now hand you, and which is marked "Complainant's Exhibit Stanton Assignment"?

A. Yes, sir; I did.

R. D. Q. 40. What is the amount of money invested by your company in its refrigerator business?

A. One hundred and seventy-five thousand dollars.

R. D. Q. 41. Does the capital stock of the company represent a part of that investment?

A. Yes, sir; it does.

R. D. Q. 42. State whether or not your company has agents and salesmen in different parts of the country for the sale of your refrigerators, and whether or not the company has expended any

money in advertising said refrigerators, and in attempting to introduce them upon the market, and thus increase its sales?

A. We have officers and salesrooms, where we carry a stock of goods, in Chicago, New York, Boston and Philadelphia, in each of which places we have resident salesmen. In addition to these, we have several traveling salesmen, who do nothing but sell our
126 goods. We have spent large sums of money in advertising our goods and placing them before the public.

Recross:

R. C. Q. 43. You say that the capital stock represents a part of the investment in the complainant company; does the balance of the investment consist in the profits accumulated?

A. No, sir; it does not.

R. C. Q. 44. Doesn't the company manufacture, very largely, boxes and packing cases for the Belding Silk Company?

A. No, sir; we never manufactured any boxes or packing cases for the Belding Silk Company.

WM. A. STANTON.

And thereupon WILLIAM S. CUTLER, being first duly sworn, in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, testifies as follows:

Q. 1. What is your name, age, residence and occupation?

A. William S. Cutler; age thirty-three years; residence Chicago, Illinois, and occupation traveling salesman for the Belding Manufacturing Company.

Q. 2. Have you ever sold the Belding Company's refrigerators to Hildebrand & Fugate, of Indianapolis?

A. Yes, sir; I sold them two car-loads of goods last January.

Q. 3. Were they customers of the Belding Company before this date; and if so, for how long?

A. Yes, sir, for three years or more.

127 Q. 4. If you had any trouble in making this sale last January state what it was and all the facts about it?

A. When I called on the—on Hildebrand & Fugate last January—I found that some one of the Challenge corn-planter traveling salesmen had been there and placed some of their refrigerators there as samples. Mr. Fugate and myself went upstairs and looked the samples over. I said to Mr. Fugate that it looked a great deal like our goods, and he said that the Challenge corn-planter men had told him that the goods were the same. Both Mr. Hildebrand and Mr. Fugate objected to buying our goods and paying more money for them than for the Challenge goods, as they thought they were the same. I finally persuaded them not to change, as they handled our goods for a long time, and I sold them two car-loads of goods at six and one-half per cent. higher than the price the Challenge corn-planter men made them, but it made a difference of eight per cent. under the price that we had previously sold them at.

Q. 5. Have you had any other customer complain to you of any

similarity in the Challenge Company's goods and your goods, and if so, who?

A. Yes, sir; Hogeboom & Co., Wahoo, Nebraska.

Q. 6. When was this and what did they say to you?

A. It was about the middle of April; they had been looking at the Challenge refrigerator and called in to see ours. They told me that they could not see any difference between the Challenge refrigerator and the New Perfection, but decided on the New Perfection and bought what goods they wanted of us.

Q. 7. Are you using the Belding refrigerator at your house; and if so, for how long a time have you used it?

A. Yes sir; for about three years.

128 Q. 8. State, for the information of the court, any points of advantage which you have observed existing in the refrigerator which you have at your house.

A. That it is very economical on ice; is substantially built; will keep provisions in perfect order, and is perfectly dry and satisfactory in every way.

Q. 9. You are not a mechanic, are you, Mr. Cutler?

A. No, sir.

Q. 10. Did you cut in two the body of the refrigerator here present, marked "Complainant's Exhibit Defendant's Refrigerator No. 1"?

A. I did; yes. Or rather, I had the carpenter cut it in two.

Q. 11. State if you noticed any difference between the construction and arrangement of this refrigerator and the Belding Company's refrigerator.

A. Yes; I noticed that the Belding refrigerator was fil-ed with charcoal and the Challenge refrigerator was filled with about nine-tenths shavings and one-tenth charcoal. This is the only material difference that I noticed between the two refrigerators. The principle and circulation of air is exactly the same.

Q. 12. What is the trade name of the Belding Company's refrigerator, and what is the trade name of the Challenge Company's refrigerator?

A. The trade name of the Belding Company's refrigerator is "New Perfection," and of the Challenge, "Challenge Iceberg."

I desire to add to my answer to question 5 that the buyer of John Pitzlaff & Company, of Milwaukee, told me that he could not see any difference between the New Perfection and the Challenge refrigerator, and that, prices being *being* equal, would prefer to handle our goods.

129 Cross-examination:

C. Q. 13. What discount from the price-list of the Belding Company did you make to the firm of Hildebrand & Fugate, of Indianapolis?

A. Forty and five and five, I believe. I think that was it, but I am not positive; I have forgotten.

C. Q. 14. What is the usual discount that you make to the trade?

(Question objected to as improper, irrelevant and immaterial, and the witness is instructed by counsel for complainant not to answer the same, but is further instructed that he may answer a question seeking to ascertain the usual discount of the Belding Company to this particular firm.)

(Counsel for defendant protests against the witness being called to testify as others have done, to the effect that the defendant has been cutting prices and thereby injuring the complainant, and then being instructed to decline to answer questions relating to the price at which complainant's goods are sold, and enters an objection to his entire deposition also as irrelevant and immaterial, and declines to cross-examine.)

WM. S. CUTLER.

Counsel for complainant offers in evidence a printed book purporting to be the second annual illustrated catalogue and price-list of the Challenge Iceberg refrigerators and ice-chests manufactured by the Challenge Corn Planter Company, of Grand Haven, Michigan, and identifies the same with this record as "Complainant's Exhibit Defendant's 1887 Catalogue."

130 And thereupon GEORGE E. MARSHALL, a witness produced on behalf of complainants, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. BROWN, Esq., as follows:

Q. 1. What is your name, age, residence and occupation?

A. George E. Marshall; age, thirty-six years; residence, Lake View, Illinois, and occupation, stationer, George E. Marshall & Company.

Q. 2. Have you ever purchased a refrigerator of the Belding Manufacturing Company's manufacture?

A. I have.

Q. 3. If you have used such a refrigerator, state for how long?

A. About for two years.

Q. 4. Have you ever purchased and used a refrigerator manufactured by other persons?

A. I have.

Q. 5. You are not, nor have not been in the refrigerator business?

A. No.

Q. 6. Are you a mechanic?

A. No, sir.

Q. 7. Now state fully, for the information of the court, what your observation has been concerning the refrigerators made by the Belding Manufacturing Company, and which you say you have used for about two years, and in doing so, you may compare it, if you choose, with any other refrigerator you may have used?

(Objected to as irrelevant and immaterial.)

131 A. One advantage that I have noticed especially is that articles of food, particularly milk, do not become impregnated

with the taste of other things in the refrigerator. This has been a serious objection to the refrigerator used previously. I find the walls of the refrigerator dry and free from sweating, and it seems to be perfectly ventilated. I consider it the best refrigerator that I have ever used, in every way.

Cross-examination:

C. Q. 8. Do you know the cause of the superiority of the Belding refrigerator in the respects you have named?

A. No, sir.

C. Q. 9. Have you ever used the Challenge or the Alaska or the Leonard refrigerators?

A. No, sir.

Redirect:

R. D. Q. 10. State the name or names of the refrigerators you have used other than the Belding?

A. The Jewett is the only one that I remember.

R. D. Q. 11. And you have used others whose names you cannot now recall; is that right?

A. I have.

GEORGE E. MARSHALL.

132 And thereupon LEONARD GOULD, a witness produced on behalf of complainant, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. Brown, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. Leonard Gould; age, fifty-two years; residence, Chicago, Illinois; and occupation, wooden willow-ware business.

Q. 2. What is the style of the firm?

A. L. Gould & Company.

Q. 3. If your firm handles refrigerators, state for how long it has handled them, and the different makes or styles you have or are now handling?

A. We have handled refrigerators for ten years or more, but principally this one, the Belding refrigerator. We have handled the Belding all the time, even before it was made by the Belding Manufacturing Company.

Q. 4. About how many refrigerators of the Belding or of other manufacture, have you sold during this period?

A. That is something that I could not come anywhere near. I might say a good many hundred. That is as near as I can put it.

Q. 5. From your experience in handling and selling refrigerators, if you have gained any information or knowledge of the superiority of the Belding refrigerator over any other refrigerator in the market, state as fully as you can your information and opinion on the subject?

A. Our experience has been that the Belding refrigerator
133 has given the best of satisfaction. We have sold all sizes of them, we have sold a great many to grocerymen, for use

in stores, and without exception they have given good satisfaction. We never had any complaints of them, and it is an article that gives universal satisfaction. We have sold a great many to our personal friends, and without exception they all speak of it in the highest terms.

Q. 6. Are you a mechanic, Mr. Gould?

A. No, sir; I am not.

Cross-examination:

(Testimony objected to as irrelevant and immaterial, and cross-examination declined.)

LEONARD GOULD.

By agreement of counsel the further taking of testimony is adjourned until Wednesday, June 12, 1889, at 10 o'clock a. m.

WEDNESDAY, *June* 12, *A. D.* 1889—10 o'clock a. m.

Met pursuant to adjournment.

Present, C. C. Poole, Esq., for complainant; Arthur Stem, Esq., for defendant.

And thereupon ROBERT D. O. SMITH, a witness produced on behalf of complainant, being first duly sworn, testified in answer to interrogatories propounded to him by C. C. POOLE, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

134 A. Robert D. O. Smith; age, fifty-seven years; residence, Mishawaka, Indiana; and occupation, secretary of the Dodge Manufacturing Company.

Q. 2. Please state what experience you have had in mechanics, and in the comparison of inventions with letters patent, which will tend to qualify you to testify as a mechanical expert in this suit?

A. For forty years or more, I have been interested in mechanical subjects, and from 1863 until October, 1887, I was continuously engaged in business as solicitor of patents in the city of Washington, and in connection with that business I was daily engaged in investigations concerning mechanical subjects, the preparation of specifications for the Patent Office, and making of examinations as to novelty with reference to patentability or state of the art with reference to the litigation of patents. For the past fifteen years, however, I have frequently been called upon to testify in mechanical cases and the litigation of patents.

Q. 3. Have you ever given any special attention to the study of the law relating to the movement and action of air currents?

A. I have; some years ago I had occasion to give special study to the subject of drainage and ventilation, and to the subject of lamps and lanterns of the tubular class.

Q. 4. Have you examined United States letters patent No. 204,216, issued to R. T. Hambrook, May 28, 1878, for improvement in refrigerators, and do you understand the invention therein set forth and claimed?

A. I have examined said patent, and I believe that I understand it.

Q. 5. Have you examined the refrigerator here introduced
135 in evidence, and marked "Complainant's Exhibit Complainant's Refrigerator," and if you have, please state whether or not said refrigerator in your judgment, is made substantially in accordance with the description and drawing of the said Hambrook patent.

A. I have examined the refrigerator, and I think it is in substantial identity with the description and drawings of the patent.

Q. 6. Please state what you understand to be the invention set forth and claimed in the said Hambrook patent.

A. The specification of the Hambrook patent is, as I think, unskillfully prepared, inasmuch as it commences with a statement of the nature of the invention which is capable of a broad construction, and ends with a series of disclaimers. It is therefore necessary, in construing the patent, to use some discretion as to the apparent conflicts of these two parts of the specification. So far as this matter is concerned, the third disclaimer in these words, "Neither do I claim the principle of ventilating the provision chambers by means of a descending current of cold air displacing and causing to ascend the less frigid air," is the only one of importance. This admits, what is undoubtedly true, that at the date of the Hambrook patent, it was not new to construct refrigerators in such a way that the coldness of the ice would cause a circulation of air through the interior chambers of the refrigerator, and that therefore this patent must refer to a special construction or interior arrangement, and the features of it may be stated in brief to consist of a compartment for the ice, one or more compartments for provisions, separated from each other by a partition or partitions,
which extend up by the side of the ice-chamber, and under-
136 neath the same, the spaces at the sides communicating at the bottom with the provision chamber, and at their top, with the ice-chamber, below the top of the same, and with a central opening beneath the ice-chamber for communication between said ice-chamber and the provision chamber; the arrangements of these openings being such that the air cooled through contact with the ice will descend through the central opening into the provision chamber, and displace therein equal volumes of warmer air, which will be thereby caused to ascend the side passages and flow into the ice-chamber near the top, thereby setting up and continuing a circulation so long as the ice remains. I believe from what I recollect of this art, that, broadly stated, this arrangement was not new at the time of the Hambrook patent, and that the patent must therefore refer to some lesser and minor peculiarities. The claim of said patent refers to provision chambers, the ice-chamber, the ice-rack, and double-inclined bottom pieces, provided with a central opening, troughs to catch and carry away the drip, a drip-pipe to receive the drip and carry it out of the refrigerator, and a plate above, and large enough to cover the central opening, to prevent drip passing down through the same into the provision chamber.

The provision chamber, the ice-chamber and the rack are the common features in refrigerators of this class. A drip-pipe to carry away the drip-water is also a common feature in these refrigerators, and I therefore am compelled to look for novelty into those members of the combination referred to as "bottom pieces," provided with a central opening, troughs, side passages, and deflector plates. With reference to these elements, the bottom pieces are inclined, so as to run the water in some
137 direction, and the sheet of zinc or other material which covers and protects the sustaining board or bottom is flanged at its edges around the central opening, so as to arrest the water which drips from the ice and prevent it from pouring down through the central opening. The protecting plate K, as it is called in the patent, is large enough to cover said central opening and is placed above the same to prevent the water of condensation or the drip from falling from the ice-rack down through said central opening into the provision chamber. The side passages through which air ascends, open laterally into the ice-chamber below the top of the same, and I think necessarily so in contemplation of this patent, because, in the second paragraph of the specification it is stated "The ice-chamber is constructed in such manner that the air will impinge upon the top, bottom and sides of the ice." The word "impinge" I think is important, and implies that at the top of the air passages there is provision for giving the air currents their proper direction towards the top and sides of the ice, and in the drawing I find such provision to be in the plates designated by the letter *e*.

Q. 7. Does the claim, in your understanding of it, include either a single or divided provision chamber?

A. I do not think it includes a partition, for the reason that it is not mentioned in the claim, and, obviously, it would make no difference with the circulation of air whether the partition was present or absent.

Q. 8. Please examine "Complainant's Exhibit Defendant's Refrigerator No. 1," and "Complainant's Exhibit Defendant's Refrigerator No. 2," and compare the same with "Complainant's Exhibit Hambrook Patent," and also with "Complainant's Exhibit Complainant's Refrigerator," and state whether or not you find
138 in either or both of said exhibits Nos. 1 and 2, the invention described and claimed in the said Hambrook patent; please also state what similarity, if any, exists in the construction of the exhibits complainant's and defendant's refrigerators.

(Counsel for defendant desires to enter an objection to the continued introduction of evidence relating to the similarity or dissimilarity of defendant's and complainant's refrigerators, the bill of complaint alleging infringement of a mechanical patent, and is not based upon any alleged infringement or trespass upon complainant's design or trade-mark, or feature distinguishing defendant's machine to the trade, aside from its mechanical construction. The comparison should be limited to any resemblance between the construction claimed in the patent and that of defendant's refrigerator.)

A. I have examined the refrigerators, complainant's refrigerator, and Complainant's Exhibit Defendant's Refrigerator, No. 1, and they appear to me to be identical in arrangement, and almost identical in structure; so much so that I cannot perceive any reason for thinking there would be any question whatever in results, in use, as I have already expressed my opinion that the complainant's refrigerator is a substantial identity of the description and drawings of the patent; I should have added, with the claims of the same. There is no doubt in my mind that the refrigerator, Complainant's Exhibit Defendant's Refrigerator, No. 1, is also in substantial identity with the description, drawings and claim of said patent. Complainant's Exhibit Defendant's Refrigerator, No. 2, appears to be the same in structure throughout, with the exception of the partition, it being of smaller size, and having only one provision
139 chamber; I mean the same in structure throughout, with Complainant's Exhibit Defendant's Refrigerator, No. 1, excepting the partition.

Q. 9. Please state your reasons for the opinion which you have expressed to the effect that defendant's refrigerators, Nos. 1 and 2, severally contain the invention of the Hambrook patent, referring more in detail to the parts or elements set forth in the claim of that patent?

A. I find in the refrigerators referred to, the ice-chamber and the provision chambers located with the same relation to each other as shown in the patent. I find below the ice-chamber, and between it and the provision chamber, an inclined bottom, with a drip-pipe located at its lowest point; that said bottom has a central opening, and is covered with a sheet of metal, the edges of which, around said opening, are turned up, to prevent drip-water from running through said opening into the provision chamber; I find above said opening, and below the ice-rack, a plate, designated as letter K in the claim, to prevent water of condensation, or drip from the ice, from falling down through said opening into the provision chamber, and at the tops of the side passages are plates, designated in the drawing by the letter *e*, arranged so as to deflect the rising air currents, and cause them to impinge upon the top and sides of the ice. The only variation in structure, as actually shown in the drawing, consists, first in the form of the upturned edges of the metal lining of the bottom, which in the drawing constitutes a trough semicircular in section, and in the refrigerator a trough angular in section, both being common forms, and well understood for like purposes; second, the deflector plate K in the drawing is decidedly curved in cross-section, and in the refrigerators it is nearly flat, or very
140 slightly curved; third, the ice-rack in the bottom is composed of slats and in the refrigerator are of corrugated metal, and, fourth, the partition, in the drawing, extends upward to the ice-rack, and in the refrigerator terminates near the level of the bottom of the ice-chamber. The relative arrangement of all these parts is the same as shown in the drawing, and all the physical effects, as regards circulation, would be precisely the same as that shown in the drawings; and fifth, the bottom of the ice-chamber is, in the

drawing, sloped towards the centre, and in the refrigerator is sloped towards the rear. In the drawing the drip-pipe is apparently located at the front of the refrigerator, and in the refrigerator it is located at the back; but, wherever located, the drainage must necessarily be towards that point, and it is so in the drawings and in the refrigerator. The location of the drip-pipe is not material, except for reasons of convenience, and I believe is universally now arranged at the back.

Q. 10. Do you find in the specification of the patent a description of more than one way of arranging the drip-pipe?

A. I do. The specification provides, column 2, page 1, that the "waste pipe *z'*, located in the front or rear of the refrigerator, as may be preferred," and in the fourth paragraph of page 2, it is provided that the troughs or gutters may be arranged to discharge into a recess, designated by the letters *s*, *s*. "And in such event the waste pipe *z'* does not reach the gutters *z*, *z*, but is firmly and securely soldered to the bottom of the recess *s*, *s*, so as to drain it of the water, which is drained from the gutters *z*, *z*."

Q. 11. Do you understand the terms of the claim to cover
141 the waste pipe and gutters, then arranged in either of the ways described in the specification, as well as when arranged as shown in Complainant's Exhibits Defendant's Refrigerators Nos. 1 and 2?

A. I do. The concluding words of the claim are: "and the trough *z* and pipe *z*, all substantially as described and shown, and for the purpose set forth." There is no doubt in my mind that the structure of the exhibit is substantially the same as described and shown, and identically for the purpose set forth.

Q. 12. What is your understanding of the term "double-inclined bottom pieces *x* and *y*," used in the claim?

A. Those words in the claim, used with reference to the particular incline shown in the drawings, which incline was designed and has the effect of conducting the water to the drip-pipe. The incline, as shown in the drawings, is very much greater than would be required, and, I think, is substantially and fully identical in purpose and effect of the incline in the refrigerator exhibits here, which, while they have very slight inclination from side to side, have a decided inclination towards the rear, where the drip-pipe is located, and I am very certain that all of the effects contemplated or possible in a structure exactly like the drawing are produced in the refrigerators referred to.

Q. 13. What, in your opinion, is the advantage gained by so arranging the upper ends of the lateral air passages, that the air therefrom will impinge upon the ice, as set forth in the specification of the Hambrook patent?

A. There is no doubt, whatever, in my mind, that that arrangement facilitates circulation of the air, because it brings the upper current directly into the refrigerator chamber at the top of
142 its upward course, and by imparting to the air currents a direction which will cause them to impinge the top and sides

of the ice, will necessarily cause them to be refrigerated more quickly than if they were caused to flow upon one side only.

Q. 14. You have pointed out, in comparing the construction shown in the Hambrook drawings, with defendant's refrigerators, both numbers 1 and 2, certain formal differences in construction. Will these differences, in your opinion, produce any different effects or result in the practical use of the refrigerator?

A. There are none which I perceive.

Q. 15. Please state whether or not, in your opinion, Complainant's Exhibit. Complainant's Refrigerator and Complainant's Exhibit Defendant's Refrigerator No. 1, are so similar in construction and arrangement that a person giving such attention thereto as an ordinary purchaser would give, would be misled by such similarity, so that he might purchase one of said refrigerators, thinking it to be the other.

(Same objection as entered to question 8 repeated.)

A. I think that the constructions are so nearly alike, in all particulars, that it would require a pretty careful examination and comparison of the two refrigerators, by a person acquainted with mechanics, to discover any difference at all, and that an ordinary purchaser would be unable to tell one from the other, if they stood side by side. There are some differences in the exterior finish and ornamentation, which a mechanic might take note of, if asked to critically compare them, but which no ordinary person would observe as indicating any difference, either in structure or origin.

Q. 16. Please state what you consider to be the differences,
143 if any, in the results arising from the use of the flat or nearly flat deflecting plate, of defendant's refrigerators Nos. 1 and 2, as compared with the deflector K, of the Hambrook patent.

A. There would be no difference in result. Water from above, whether of condensation or drip from the ice, would be carried off to the edges of the plate, and delivered upon the bottom of the ice-chamber, exterior to the central opening thereof, and moisture of condensation from moist air, entering when the door should be opened, gathering upon the under side of said plate, would also run to the edge and drip off upon said bottom, thus protecting the provision chamber below from drip through the central opening.

Q. 17. How do you understand that the deflector plate K, shown in the Hambrook drawing, is sustained?

A. In the last paragraph of page 1 of the specification, the plate referred to is described as being "securely fastened," but the object to which it is attached is neither designated in the specification nor determined by the drawing. It is shown in the drawing as in contact with the slat on which the ice rests, and the lines of the cross-cleat, to which said slats are connected, extend through said plate. Obviously the object to be attained is to securely fasten said plate to something which will maintain it in its proper position above the central opening, while the refrigerator is in action, and that object may be attained equally well by attaching said plate to the ice-rack as to the partition. In the third paragraph of page 2 of the

specification, it is provided that the partition may be extended up to the ice-chamber, and in that case, it will bisect the plate K, and each half thereof will then be secured to the respective sides of the partition. The nec-ssity for this is obvious, because if not so
144 secured drip-water might run down the partition past the plate K into the provision chamber, and the object of plate K would then be entirely defeated.

Cross-examination:

C. Q. 18. Do you understand the claim of the patent sued on to cover a new combination of old elements, in new relations to one another, or do you find in it elements themselves new, and not known at the date of the patent, either in the same form or an equivalent form for the purpose here used?

(Question objected to as not proper cross-examination, inasmuch as it calls for the witness'- opinion regarding the prior art, a matter which has not been touched upon in the direct examination.)

A. I understand the claims sued upon cover a new combination of old elements in new relations to one another, for the purposes set forth. I do not think either of the elements themselves were new.

C. Q. 19. In this patent are all of these elements used for a new purpose, or only part of them, and if a part only, which one?

(Same objection.)

A. I do think the general purpose was new, inasmuch as refrigerators have been before made with a circulation of air.

C. Q. 20. Is it not true that while all of these elements may never have been before combined in a single machine, that each one of them had, at the date of the patent, been used for substantially the same purpose, in substantially the same way?

A. I do not know that, that is, I do not know that all of
145 these elements had been previously used for substantially the same purpose in substantially the same way, and I do not think that they have.

C. Q. 21. Please name such of them as you do not think had been used in substantially the same way for substantially the same purpose, prior to 1878?

(Same objection to last two questions as to question 18.)

A. I do not think that I can answer that question fully and satisfactorily; but by way of an answer, which may be sufficient, it being understood that it refers only to refrigerators, I will say I do not know *how* the plate like the plate K, in any similar relations. I do not know either of plates like the plate *c*, but they are not expressed in the claim.

C. Q. 22. You are acquainted with the use in refrigerators of deflecting plates beneath the bottom of the ice-chamber, and over the opening leading to the provision chamber, for the purpose of de-

flecting drip from the melting ice, and prevent its falling into the provision chamber, prior to 1878, are you not?

(Same objection.)

A. I have no recollection of ever having seen it prior to having seen it in this patent.

C. Q. 23. Do you understand this patent to cover any deflecting plate located beneath the ice-chamber, and over the opening into the provision chamber of the refrigerator, so as to permit the free passage of the cold air down into the provision chamber, but to catch and deflect the drip from the ice?

A. That is my understanding of it.

C. Q. 24. I call your attention to letters patent 77624, granted May 5, 1868, to A. Koch, for refrigerator, and ask you whether
146 you do not find in that patent a plate located beneath the ice-chamber, and over the opening into the provision chamber, so as to permit the free passage of the cold air down into the provision chamber, but to catch and deflect the drip from the ice?

(Question objected to for the reason that it is not proper cross-examination, inasmuch as it relates to matters which were not touched upon in the direct examination, and for the further reason, that the patent referred to is not in evidence in the case, and entirely foreign to the record.)

(Counsel for defendants here offers in evidence a copy of the letters patent referred to, and marks the same "Defendant's Exhibit Koch Patent.")

(Exhibit objected to as immaterial.)

A. The questions referred to, upon which my answers were predicated as to plate K, had reference to the combination in the claim of the patent in which the plate K is one element, and while in the patent now submitted in evidence, to which my attention is called, there is a plate above the opening into the provision chamber, it is entirely destitute of other elements of the combination, which would cause or permit any such circulation of air, and the consequent result, as exists in the refrigerator built in accordance with the patent.

C. Q. 25. The plate referred to in the Koch patent is beneath the bottom of the ice-chamber, is it not?

(Same objection.)

A. It is.

C. Q. 26. It is over the opening in the top of the provision chamber, but so situated as to permit the free passage of the cold air into the provision chamber, and prevent such passage of the drip, is it not?

(Same objection.)

147 A. It is over the opening referred to, and would permit the passage of cold air, were there any such passage, but in

the structure shown in the drawings of the patent referred to, there would not be a circulation of air to any appreciable extent.

C. Q. 27. The shape of the plate is not important, is it?

(Same objection.)

A. If you mean the exterior form, it is not important.

C. Q. 28. Is the location important, provided it is such that it permits the free passage of the cold air down to the provision chamber, and catches all the drip from the melting ice, and prevents it from falling into the provision chamber?

(Same objection.)

A. No.

C. Q. 29. I call your attention to letters patent No. 62643, granted W. Law, March 5, 1867, for improvement in refrigerators, and ask you whether the plate F does not permit the free passage of the cold air down into the provision chamber, and at the same time catch all the drip from the melting ice, and prevent it from dropping into the provision chamber?

(A true copy of said patent is here offered in evidence, by counsel for defendants, and marked "Defendant's Exhibit Law Patent.")

(Same objection.)

A. In the Law patent referred to, that part which is designated by the letter F is a trough placed beneath the central opening. It is the reverse of the plate K of the Hambrook patent, especially in the particular that water of condensation, upon its own exterior surface, would have nowhere to go, except to drip into the
148 provision chamber. Its upturned edges lap past the down-turned edges of the bottom H, so that they would obstruct the flow of the cold air from the ice-chamber into the provision chamber, and I regard it as entirely dissimilar to the plate K.

C. Q. 30. The circulation of the air, in the Law patent, is the same as in the Hambrook patent, is it not?

(Same objection.)

A. It is designed to be, but is not.

C. Q. 31. Why not?

(Same objection.)

A. For the reason stated, the relations of the parts are such that the flow is impeded in the Law patent, while in the Hambrook patent the relation is such that the flow would be facilitated. The circulation of air in a refrigerator depends upon difference of temperature at top and bottom, and these differences are so slight that the circulation must always be slow and difficult, and must always be, to some extent, impeded by the passages through which it has to flow.

C. Q. 32. Is there anything in the Law patent which limits the size of the opening referred to?

(Same objection.)

A. Not that I am aware of. My answer had reference to the relation of the parts, not to dimensions.

C. Q. 33. The difference in the circulation between these two patents, then, is a matter of degree, is it not?

(Same objection.)

A. I do not think so. I think it is more than that; I think it is the difference between an organization which facilitates on the one hand and hinders on the other.

R. D. O. SMITH.

149 And thereupon BENJAMIN F. FELIX, a witness produced on behalf of complainant, being first duly sworn, testified in answer to interrogatories propounded to him by C. POOLE, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. Benjamin F. Felix; age fifty-one years; residence Chicago, Illinois, and occupation, dealer in wholesale wooden ware.

Q. 2. If you are connected with any firm, what is the style of the same?

A. Felix & Marston, of Chicago, Illinois.

Q. 3. Does your firm handle refrigerators?

A. Yes, sir.

Q. 4. Please state how long your firm has handled refrigerators, and the different makes or styles that you have handled or are now handling?

A. We have handled different kinds of refrigerators for the last fifteen or twenty years. We have handled a great many different kinds, among which is the New Perfection made by the Belding Manufacturing Company, of Belding, Michigan, and which is the one we are now handling and have been handling for eight or ten years. We handled the Perfection before the Belding Brothers began the manufacture of it. There are many others which we handled many years ago, but which I do not remember the names of.

Q. 5. State, if you can, about how many refrigerators of the Belding and of other manufacture that you sold since you have handled refrigerators?

150 A. It would be impossible to name the exact number of any one kind of refrigerators, but we have sold the New Perfection, made by Belding Brothers in car-load lots, to our customers, as well as in smaller quantities. The number will reach into the thousands.

Q. 6. From your experience in handling and selling refrigerators, if you have gained any information concerning the superiority of the Belding refrigerator over other refrigerators in the market, please state as fully as you can, the facts which you may have regarding the subject?

(Objected to as irrelevant and immaterial.)

A. In selling the Belding refrigerator, I will state that they have given universal satisfaction, and in my experience we have never

had any complaint of their quality, whatever, which is not the case of other refrigerators that we have sold.

Q. 7. Have you ever yourself used one of the Belding refrigerators; and if so, please state your opinion regarding the merits of the same?

(Same objection as before.)

A. I have used one in my family, and it has given universal satisfaction in every respect.

Q. 8. What has been your experience with regard to the usual condition of the provision chamber, as to moisture or dryness, and the perfect preservation of the articles of food kept therein?

(Same objection.)

A. The provision chamber always has been dry, and the articles contained therein have always been well preserved.

Q. 9. Have you any special acquaintance with mechanics?

151 A. I have not.

(Objection repeated, and cross-examination declined.)

BENJAMIN F. FELIX.

By agreement of counsel, an adjournment was had to Thursday, June 13, A. D. 1889, at 10 o'clock a. m.

THURSDAY, *June* 13, 1889—10 o'clock a. m.

Met pursuant to adjournment.

Present: Taylor E. Brown, Esq., counsel for complainant; Arthur Stem, Esq., counsel for defendant.

And thereupon JOHN LEWIS, a witness produced on behalf of complainant, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. John Lewis; age thirty-five years; residence Belding, Michigan, and occupation assistant treasurer of the Belding Manufacturing Company.

Q. 2. How long have you been connected with this company?

A. Since they first organized, September 1, 1884.

Q. 3. Were you ever connected with the Hambrook Manufacturing Company or the Booth & Osgood Manufacturing Company?

A. Yes; both.

Q. 4. What was the business of the Hambrook Manufacturing Company at that time?

A. In 1876, when I went to work for them in March, 1876,

152 they were making school furniture, and spool cabinets, and in 1878 they commenced the manufacture of refrigerators.

Q. 5. What kind of refrigerators?

A. The same ones that the Belding manufactory are making now.

Q. 6. If there were any mechanical features in the refrigerators

then manufactured which differed in any way from the refrigerator now manufactured by the Belding Company, state what they were.

A. When we got the refrigerators on the market we found that the bottom of the ice-chamber was too weak, and in order to use a heavier bottom we brought it more on a level, put the cap, as we called it, that covered the entrance to the provision chambers, onto the ice-rack, and cut off the partition, as there was no further use for it after we had substituted a strong ice-rack.

Q. 7. How was the ice-rack supported in the original refrigerators made by the Hambrook Manufacturing Company?

A. Chiefly on the partition, and slightly on either end.

Q. 8. What was the location of the drip-pipe at that time?

A. In the front.

Q. —. Was the bottom of the ice-chamber inclined at all towards this drip-pipe?

A. Yes.

Q. 10. After the ice-box and ice-rack were made stronger, as you have said, and after you cut away the top portion of the partition between the provision chambers, how did you support or sustain the part which you have called the "cap," but which is otherwise here called the deflecting plate?

153 A. It was on the supports for the ice-rack; the same as it is now in this exhibit Belden refrigerator.

Q. 11. How was this plate secured or supported before that time?

A. It was soldered to the back of the refrigerator and to the pan for receiving the waste water, in the front of the refrigerator.

Q. 12. Was Mr. Richard T. Hambrook connected with the Hambrook Manufacturing Company at that time, and at the time also that the change was made to the present construction?

A. Yes.

Q. 13. When was this change made, if you know?

A. In the year 1881 or 1882; I don't know which exactly.

Q. 14. Do you know Mr. Levi Schofield?

A. I have met him once.

Q. 15. State when and where that was?

A. November the 11th, 1885, in our office, at Belding, Michigan.

Q. 16. Is the gentleman here present the same Mr. Schofield whom you saw at that time?

A. I believe he is.

Q. 17. State fully any conversation you had with Mr. Schofield at that time, and what occurred, if anything, between you at your office, in November, 1885?

A. Mr. Schofield introduced himself as mayor of Grand Haven, and further stated that he was manufacturing corn-planters and had a little business in our town of Belding, and as it was two or three hours before the train went, thought he would drop in and look us over; he said that being a fellow-manufacturer, although of a different class of goods, he would like to see what we were

154 doing. I took him into the shop and showed him how we made refrigerators. He expressed a belief that ours was the best refrigerator he had seen, and said that he had for seven years

a Fisher refrigerator, and would like one of ours to use in its place, selling or otherwise getting rid of the Fisher. He finally bought a No. 3, paying me twenty dollars for it, and that same day we shipped it to him at Grand Haven, Michigan.

Q. 18. Was there any entry made upon the books of the Belding Company at that time concerning this sale to Mr. Schofield?

A. Simply a cash entry.

Q. 19. I hand you a sheet of paper, being apparently pages 21 and 22 of a cash book, upon the second line of page 22 of which I find the following words: "Mdse. L. Schofield 20," and ask you to state, if you know, what this paper is?

A. It is a leaf of our cash book, used at that time, but now used for another purpose. I cut the leaf out and brought it here.

Counsel for complainant introduces the said leaf in evidence, and identifies the same with this record as "Complainant's Exhibit Page 22 Belding, 1885, Cash Book."

Q. 20. What words or figures do you find on this exhibit paper, if any, relating to the transaction of which you have testified?

A. "Nov. 11, mdse. L. Schofield, 20."

Q. 21. What do the figures "1885" mean, at the top of this first column?

A. The year in which the entry was made.

Q. 22. Is that the original entry of this transaction?

A. It is.

155 Q. 23. Was it made upon the date appearing upon that exhibit, if you know?

A. It was.

Q. 24. In whose handwriting was the entry?

A. Mr. Brinton F. Hall, who was at that time getting posted in the refrigerator business, and who is now manager of our Boston office.

Q. 25. State whether or not you saw Mr. Hall make this entry upon this page of the cash book, at that time?

A. I don't remember, but as I had charge of the cash, and that balanced, it must have been made at the time.

Q. 26. From what source did Mr. Hall obtain the information from which to make this entry?

A. I told him to, at the time I received it, or within a few minutes after.

Q. 27. When did you first learn of the existence of the refrigerators manufactured by the Challenge Corn Planter Company, and known as the "Challenge Iceberg"?

A. During the winter 1885–1886.

Cross-examination:

C. Q. 28. When the Hambrook refrigerator was first manufactured, it was substantially like the drawing of the Hambrook patent, which I now show you, was it not?

A. Except that the two gutters did not run directly into the waste pipe, but into a pan, in the front of the refrigerator, and the

ends of the ice-rack rested on the bottom of the ice-chamber. That is the only change I see.

C. Q. 29. When was the refrigerator first made in all its details like it is made now?

156 A. I cannot give you the exact year, but I think 1881 or 1882. I am not sure about the year, myself.

C. Q. 30. Who made these changes?

A. I don't know; but I think it was while Mr. Hambrook was president of the company. I was away at the time.

C. Q. 31. How long were you away at that time?

A. I don't remember. It is pretty hard to go back ten years and tell that.

C. Q. 32. What time of the year was this change made?

A. During the winter.

C. Q. 33. Where was it made?

A. At 225 South Canal, Chicago.

C. Q. 34. Do you know whether any new men came into the employ of the company at about that time?

A. Yes, several of them.

C. Q. 35. Do you know where they came from?

A. Some of them I do, and some of them I don't.

C. Q. 36. Please state where those came from which you do know.

A. Mr. Isaac Osgood, and Mr. A. M. Osgood, from Utica, New York; Mr. George Booth, I don't know where from. He was a brother of William S. Booth, who afterwards bought out Hambrook. Mr. C. O. Nash, from Utica, and Mr. George R. Hotchkiss, Michigan City, Indiana.

C. Q. 37. What was Mr. Hotchkiss before he came into the employ of your company, if you know?

A. Traveling salesman for the Alaska Refrigerator Company, or the Smith Manufacturing Company, as I think it was then, of Michigan City, Indiana.

C. Q. 38. Do you know where Mr. Hotchkiss is now?

157 A. I do not.

C. Q. 39. Were you familiar with the construction of the Alaska refrigerator, or the Smith refrigerator, before these changes were made in the Hambrook?

A. Yes.

C. Q. 40. It was constructed with a plate upon the lower side of the ice-rack, and over the opening into the provision chamber, at that time, substantially the same as it is now, was it not?

A. I can only say that I cannot answer it positively, not having examined it in detail.

C. Q. 41. The refrigerator that is now known as the Alaska, was first manufactured by the Smith Manufacturing Company, under letters patent granted G. F. Smith, was it not, at Michigan City, Indiana?

A. I think so, but cannot say positively.

C. Q. 42. At the time you sold the refrigerator to Mr. Schofield,

referred to, and prior to that time, did the Belding Company mark its refrigerators as "patented"?

A. I believe they did.

C. Q. 43. Do you know when they commenced to mark them as patented?

A. When they first started manufacturing, I think.

C. Q. 44. Don't you remember, on that occasion, that you went through the factory with Mr. Schofield, when he selected the refrigerator which you sold him?

A. No; he did not select it.

C. Q. 45. Who did select it?

A. The shipping clerk took it right out of the stock, I am sure.

C. Q. 46. Didn't Mr. Schofield go through the factory and examine the various refrigerators, or the different styles and sizes, before making the purchase?

158 A. Yes.

C. Q. 47. Didn't he, on that occasion, call your attention to the fact that there was no patent mark on them, and ask you whether they were not patented?

A. I don't remember.

C. Q. 48. Don't you remember stating to him that they had formerly been marked "patented" under the Hambrook patent, but after the change was made they had not been marking them patented, and that you didn't know the reason why?

A. I don't remember saying so.

C. Q. 49. Isn't it a fact that for some time after the change was made in the construction of the refrigerators, that no patent mark was placed upon them?

A. I am not quite sure; I don't think it was, and yet I have some kind of a recollection that there was some sent out without the patent mark on them. It was a mistake, any way, if it was so.

C. Q. 50. When they were marked as patented, when was the mark put on them? As soon as they were finished, or after they were crated and ready to be shipped?

A. Just before they were crated—they should have been and probably was.

C. Q. 51. As soon as they are finished they are crated and put into the warehouse, to await orders, are they not?

A. Yes; as soon as the last coat of varnish is dry.

C. Q. 52. When the Hambrook refrigerator was changed, in 1881 or 1882, after Mr. Hotchkiss came into the employ of the company, it was made just like the Alaska or Smith refrigerator, except that in the Smith refrigerator the warm air enters the ice-chamber through the top, immediately over the ice, instead of at the ends near the top, as in the Perfection?

159 (Question is objected to by counsel for complainant, because calling for the comparison of the Belding refrigerator with the refrigerator known as the Alaska or Smith, while the witness has said in answer to cross-question 40, that he had not examined such refrigerator in detail, and therefore he is not qualified as an expert or otherwise to answer the question. Question further

objected to as immaterial, irrelevant and improper, and further because the question further assumes that the date of the change in the construction of the Hambrook refrigerator to have been after the date when Hotchkiss was employed by the Hambrook Company, while the witness has not testified to any such fact.)

A. Not having examined it in detail, I don't know.

Redirect:

R. D. Q. 53. In answer to cross-question 30, you have stated substantially that the changes in the Hambrook refrigerator were made at a time when you were away. State what you meant by the use of the word away.

A. Out of town.

R. D. Q. 54. You were connected with the company at the time, were you not?

A. I was.

R. D. Q. 55. It is in evidence here that the Hambrook Manufacturing Company, in October, 1882, changed its corporate name to "The Booth & Osgood Manufacturing Company." State, if you know, whether or not R. T. Hambrook, the patentee, was connected with the Booth & Osgood Company after this change of corporate name?

160 A. No, he was not. He sold out in the July or August previous.

R. D. Q. 56. Do you know whether or not Mr. Levi Schofield visited the office and factory of the Belding Manufacturing Company, at Belding, at any time prior to November 11, 1885, upon which date you say he purchased a refrigerator of you?

A. I have been informed that he did, but I did not meet him.

R. D. Q. 57. When and where did you get that information?

(Objected to.)

A. From Mr. Ranney, after he had been there in November 1885.

R. D. Q. 58. How soon after?

A. A day or two.

JNO. LEWIS.

UNITED STATES OF AMERICA.

STATE OF ILLINOIS, } ss:
County of Cook, }

I, Marie L. Price, a notary public in and for the county of Cook and State of Illinois, do hereby certify that the foregoing depositions of Melville E. Dayton, Hiram H. Belding, James W. Nye, Fred. E. Ranney, William A. Stanton, William S. Cutler, George E. Marshall, Leonard Gould, Robert D. O. Smith, Benjamin F. Felix and John Lewis, were taken by and before me pursuant to notice at the office of Poole & Brown, No. 225 Dearborn street, Chicago,

Illinois, commencing on the 6th day of May, A. D. 1889, at
161 10 o'clock a. m.; that said depositions were taken on the part of the complainant to be used on the hearing of a certain cause now pending in the circuit court of the United States, for the western district of Michigan, southern division, wherein The Belding Manufacturing Company is complainant, and The Challenge Corn Planter Company is defendant; that the parties to said cause were present at the taking of the same, complainant by its counsel, Taylor E. Brown, Esq., and C. C. Poole, Esq., and defendant by its counsel, Arthur Stem, Esq., as therein appears; that before deposing the said Melville E. Dayton, Hiram H. Belding, James W. Nye, Fred. E. Ranney, William A. Stanton, William S. Cutler, George E. Marshall, Leonard Gould, Robert D. O. Smith, Benjamin F. Felix and John Lewis, were by me duly sworn to testify the truth, the whole truth and nothing but the truth, in the cause aforesaid, and their depositions reduced to writing by me from their statements, and the same duly subscribed by the said witnesses before me, with the exception of the witness Melville E. Dayton, whose cross-examination has not yet been taken.

And I do further certify that I am neither attorney nor of counsel for any of the parties in said depositions or caption named, and am in nowise interested in the result of said cause.

In testimony whereof, I have hereunto set my hand and affixed my notarial seal this 13th day of June, A. D. 1889.

M. L. PRICE,
[NOTARIAL SEAL.] *Notary Public.*

162 UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division.

THE BELDING MANUFACTURING COMPANY, Complainant,
vs.
THE CHALLENGE CORN PLANTER COMPANY, Defendant.
} In Equity. No. 963.

Testimony taken — consent at the office of Poole & Brown, Temple court, Chicago, Illinois, before me, Lizzie Clark, a notary public in and for the county of Cook and State of Illinois, this 16th day of November, 1889, to be read in evidence at the hearing on behalf of complainant.

Present: Taylor E. Brown, Esq., counsel for the complainant, and Edward Taggert, Esq., counsel for the defendant.

MELVILLE E. DAYTON, being first duly sworn, in answer to interrogatories propounded to him by the counsel for defendant, testifies as follows, to wit:

Cross-examination by counsel for defendant:

C. Q. 1. In the Hambrook refrigerator, what supports the deflector plate, K?

A. It rests on the top of the partition *a*.

C. Q. 2. As the ice-rack is constructed in the Hambrook refrigerator, does it allow the water to pass freely through it from the melting ice?

163 A. It is free to pass through the spaces between the rack-bars, and a portion of it will doubtless do so, while other portions will flow along the surfaces of the rack-bar and drip off at their ends.

C. Q. 3. What is the function of the projections *e e*?

A. To deflect the rising current of warm air towards the ice, and to guard the vertical passages through which such warm air enters the ice-box against the admission of fragments of ice, as for example, when a piece of ice is being put in the ice-chamber.

C. Q. 4. In what direction do the bottom pieces *x* and *y* incline?

A. Towards the central opening *d*.

C. Q. 5. What do you understand to be the meaning of the term "double-incline bottom pieces" as used by Mr. Hambrook in his specifications?

A. The word "double" in the expression referred to, I understand to have reference to the formation of the bottom of the ice-chamber, in two parts, making it in a two-part or in a sense a double bottom. The meaning of the word "inclined," I think is obvious, and indicates merely the inclination of the several parts of the bottom by which they carry off the water that drips from the ice. The statement of the specifications is that, "The bottom pieces *x* and *y* incline sufficiently towards the center to readily carry off the drip from the ice." * * * The words "double-inclined bottom," do not occur in the body of the specification, I believe.

C. Q. 6. Do not the bottom pieces *x* and *y* incline in opposite directions?

A. They do, as they are shown in the patent.

C. Q. 7. How are the bottom pieces *x* and *y* supported?

A. They are said to be supported from the front and rear walls of the box, which they divide.

164 C. Q. 8. Supposing a full-size refrigerator, 40 inches broad, constructed in accordance with the Hambrook specification, how near would the bottom pieces *x* and *y* approach each other?

A. That would be a matter of mere judgment in construction. The patent makes a suggestion at the top of page 2, first column, but says in connection with that suggestion, that the spaces "may be of any other width." It is therefore left entirely to the judgment of the constructor.

C. Q. 9. Are you acquainted with the construction of the refrigerator which is now made by the Belding Manufacturing Company?

A. In the understanding that they are manufacturing refrigerators like that in this case marked "Complainant's Exhibit Complainant's Refrigerator," I am.

C. Q. 10. In the refrigerator referred to by you in your last answer, does any part of the water, which drips from the melting ice, come in contact with the deflector plate?

A. It may, and probably does, and it is in the expectation that it will, manifestly, that the deflector plate is provided, as well as to deflect the water that would form in drops on the bottom of the corrugated plate which supports the ice. In the slow melting of ice and the movement of drops or small bodies of water, from the top of the ice-holder or corrugated plate, such drops, instead of falling off the edges of the plate, are quite likely to cling to the plate and follow along on its under surface, until they reach the lowest point of such under surface. From this tendency of the water and directly resulting from the melting of the ice, it is certain, I think, that some of it falls upon the top of the deflecting plate, and drips from the edge of the plate to the bottom of the ice-chamber,
165 or follows the wooden cross-bars from the bottom of said plate to the inclined bottoms of the ice-chamber.

C. Q. 11. Do you think the statement, in the second paragraph of the specification, where the term "provision chamber" is used, broadens the claim so as to make it embrace a refrigerator having a single provision chamber?

A. I don't think that statement of the specification is necessary to give such a breadth to the claim, because I think the claim would be so broad as that in the absence of any reference in the patent to a single provision chamber, partly for the reason that the partition *a* is not mentioned or made an element of the claim, and partly for the reason that the presence or absence of such partition does not effect the operation of the device, due to the construction otherwise specified in the claim. I, however, understand the reference to a single provision chamber, referred to in the question, as clearly indicating the intention of the patentee not to be restricted to a double provision chamber or one having the partition *a*.

C. Q. 12. Does the statement contained in the second paragraph of the specification, fully and clearly state and define the scope of the Hambrook invention?

A. I don't think it does. It is rather a statement of the purpose or object of the invention, notwithstanding it says: "The nature of my invention consists," etc. In so far, however, as said paragraph refers to or specifies particular parts of the structure, it seems to me said paragraph may be regarded as a portion of the description or specification proper, and that therefore, the mention of a single provision chamber here has the same significance as though it were made in any other part of the specification.

166 C. Q. 13. Would you say that the term "provision chamber" in the fifth paragraph on page 1 of the specification, has the same significance as it has in the second paragraph?

A. The paragraph referred to in the last question, is more especially a description of the drawing, as an illustration of the embodiment of the invention, than as a statement giving scope to the invention. Here it is pointed out that the provision chamber is present and that in the drawings *a* is a partition, dividing said provision chamber into two chambers or compartments. This is no more definitely stated than that each compartment is provided with a separate door, and further, that these doors are hinged at

their outer edges, so as to open from the center outwards. I do not consider the fact that the partition *a* as herein referred to is any more significant than the fact that the doors are hinged at their outer edges. The essential fact is that there is a provision chamber and it is an immaterial fact, in my judgment, that said chamber is divided. The reference to the provision chamber in the singular number in this paragraph is perhaps, not so significant as in the second paragraph, for the reason that in the latter, the invention is more directly the subject of description, and in the former the drawing or illustration is more directly the subject of description.

C. Q. 14. What is the function of the deflector plate K, in the Hambrook refrigerator?

A. To prevent the passage of water from the ice-chamber to the provision chamber, in keeping with the general statement of the second paragraph, "that the continuous volume of cold air generated by the melting of the ice, will descend in a dry state to
167 the provision chamber." At the bottom of page 1 the patent says that the plate K is "so arranged as to allow the drip from the ice to fall from said strip of metal upon the bottom board *x* and *y*, clear of the spaces *d d*."

C. Q. 15. Do you consider the location or shape of the opening, above which the deflector K is placed, as in any way material to the Hembrook invention?

A. I am disposed to think that it is necessarily an opening running from front to rear, or practically so, so as to leave practically two bottom pieces, *x* and *y*, and also, I think, to conform in extent, practically, with the similarly extended passages *c c*, which rise at the sides of the ice-chamber and are substantially of full width. This gives a wide sheet or current of cold air down the middle of the refrigerator, and a correspondingly wide sheet or current of warmer air ascending at the sides of the refrigerator. Corresponding width in these two currents facilitate continuous and direct movement of the air to and from the several chambers without eddying, in keeping with the statement of the second paragraph of the patent, to the effect that the circulation shall be "without material hindrance."

Adjourned until 2 o'clock p. m.

Met pursuant to adjournment and resumed testimony of Mr. DAYTON:

C. Q. 16. Supposing that the partition *a* extended upward to the top of the ice-chamber, and one-half of the refrigerator should be removed, and a suitable case should be provided for the half remaining, would the use of such half be an infringement upon the Hambrook patent?

A. I think the terms of the claim would not be applicable
168 to the structure supposed in the question. The claim distinctly calls for two bottom pieces, *x* and *y*, separated by a central opening, and in the supposed structure there would not be two bottom pieces and there would not be a central opening. The

idea of the construction described in the patent and specified in the claim, seems to me to be an ice-chamber, a two-part bottom, with a passage in the middle, a subjacent provision chamber or chambers and two side passages, *c*. While a partition may be placed in the provision chamber, and while, indeed, that partition may be extended up into or through the ice-chamber, under the specification and claim, it strikes me that the idea of the inventor, as stated in the specification and claim, would not be embodied in the structure supposed.

C. Q. 17. Supposing the partition *a* extended through the ice-chamber in the Hambrook refrigerator, shown in figure 2 of the drawings, would not the part of the refrigerator on one side of said partition operate entirely independent of that portion of the refrigerator on the other side of the partition?

A. It would.

C. Q. 18. It would then be practically two refrigerators, one operating independently of the other, would it not?

A. It would, but it would still be a single refrigerator, having the characteristic features of construction and arrangement of its parts specified in the claim, and would answer to the terms of said claim.

C. Q. 19. Do you think that Mr. Hambrook, by the use of the term "double-inclined bottom pieces *x* and *y*," merely intended to locate the opening at the center of what, in your direct examination, you called the horizontal partition?

169 A. I think he meant to specify the double or duplex character of the bottom of the ice-chamber, and an inclination sufficient for drainage. He seems not to have relied on these terms to indicate the location of the opening, for, in the claim, he follows said term immediately by the words "provided with a central opening."

C. Q. 20. You think then that the central opening was a necessary and material part of the Hambrook invention?

A. The patentee seems to have made it so by the expressed terms of his claim, and he has not indicated in the specification anything to the contrary by any statement that this location of the opening may be changed.

C. Q. 21. Do you think it material which way the double bottom pieces *x* and *y* are inclined?

A. I do not, for the reason that the purpose of such inclination is stated to be merely the drainage of the water therefrom and obviously this may be done in any direction with the exercise of no more than mechanical judgment.

C. Q. 22. Is it not a fact that the table which supports the ice in the defendant's refrigerator, has no opening for the passage of air or water?

A. It has no opening through it, but the grooves of the corrugated plate are openings which give access of air to the bottom surface of a block of ice, until the ice shall have melted away to fit and fill the grooves. After it has done this the thin metal plate is a medium through which the air can transmit its heat readily to

all parts of the under surface of such block of ice, with substantially the same effect, as it may do so through the openings between the wooden slats of the ice-rack shown in the patent. In other
170 words, a rack of wood (which is a non-conducting material), provided with slots between the wooden slats of the rack, has, in my judgment, a full equivalent in the corrugated metal plate actually employed by complainant in their refrigerator, and present in Complainant's Exhibits of Defendant Refrigerator.

C. Q. 24. Would the defendant's refrigerator be a mechanical equivalent of the device particularly described in the claim of the Hambrook patent if the deflector, as it has been called, were omitted?

A. If the deflector were omitted and no equivalent were substituted therefor, it is my opinion defendant's refrigerator would not contain the combination of elements, and the characteristic features of construction and arrangement of parts specified in the claim.

C. Q. 25. Supposing that a refrigerator in all respects like one-half of the Hambrook refrigerator, divided on a line through partition *a*, had been invented prior to the Hambrook invention, would it require any invention to add another refrigerator thereto, so as to complete a structure similar to the one shown in the Hambrook patent?

A. I think it would, for the reason that such a construction as Hambrook has made is not a mere duplication of the supposed refrigerator, or a placing of one such supposedly old refrigerator alongside another one. Hambrook has made a unitary structure which, in its best form, as he illustrates and describes it under the statute, is not two refrigerators, but one; and, as one refrigerator, has one ice-chamber, and may have either one or two provision chambers. It is a characteristic of this unitary and single refrigerator of Hambrook's that it has a single central passage through the bottom of the ice-chamber for the downflow of cold air,
171 and two passages, one at each side of the ice-chamber, for the upflow of warmer air. To mention no other differences between this unitary structure and the supposed structure of the question, it is evident that putting two such old refrigerators as have been supposed, side by side, does not make this structure, which is shown and described by Hambrook, as the best form of his invention, and that, therefore, something more than mere mechanical skill or the placing of two old refrigerators side by side was performed by Hambrook in making his device.

C. Q. 26. Supposing in the defendant's refrigerator, a wooden strip were placed beneath the ice-table and over the opening into the provision chamber, would that be a mechanical equivalent in your opinion to the Hambrook invention?

A. I suppose the question means, would that be the equivalent of the metal strip K, which is one feature of the refrigerator, that, as a whole, constitutes Hambrook's invention? On this supposition I point to the patent as answering the question. Near the bottom of column 2, page 1, the patent in speaking of this deflector K says, "It is a narrow sheet of curved metal or other suitable substance."

If wood be a suitable substance (and I see no reason why it may not be), and if the wooden deflector is placed in the same position, so as to operate with the same effect, I think it would fall within the invention of the patent.

C. Q. 27. Supposing in the defendant's refrigerator we substitute the wooden strip referred to in my last question, and a flat ice-table instead of a corrugated ice-table, would we still have a refrigerator containing the invention described and claimed in the Hambrook patent?

172 A. If the refrigerator in other respects corresponded with the Hambrook construction, I see no reason now why the supposed change, as I understand the question, would not fall within the Hambrook patent.

C. Q. 28. Do you understand this patent to cover any deflecting plate located beneath the ice-chamber, and over the opening into the provision chamber of the refrigerator, so as to permit the free passage of the cold air down into the provision chamber, but to catch and deflect the drip from the ice?

A. It is my understanding that in a refrigerator otherwise constructed in accordance with the Hambrook patent any deflecting plate occupying essentially the same position and producing the same results, will fall within the patent. I do not understand that any and all deflecting plates arranged in any and all relations to refrigerator passages were new with Hembrook. If the question refers to modifications in the general structure and a different relation of the deflector to its adjacent part than that shown in the patent, I shall need to be shown the particular construction and arrangement had in my mind by counsel before I can answer more specifically.

C. Q. 29. Is it not a fact that refrigerators were constructed long prior to the Hambrook invention, containing substantially the same air passages and operating in substantially the same way as the Hambrook invention? I refer particularly to the movement of the air from the ice-chamber down into the provision chamber, and the rising of the warm air from the provision chamber to the ice-chamber.

A. It is.

173 C. Q. 30. Does the Hambrook patent cover any new element or is it simply a combination of old elements, which elements were well known in refrigerators?

A. I think all the elements of the Hambrook refrigerator, considered individually and generally, were old, and the Hambrook patent presents only a new form of combination and arrangement of old elements, which, as he combines them, presents a structure that, as a whole, is new.

MELVILLE E. DAYTON.

174 *Notary's Certificate.*

STATE OF ILLINOIS, } ss:
County of Cook, }

I, Lizzie Clark, a notary public in and for said county and State, duly authorized to administer oaths, do hereby certify that on the 16th day of November, 1889, commencing at ten o'clock in the forenoon of that day, the deposition of Melville E. Dayton, a witness on the part of the complainant in the case entitled in the caption hereto, *were* taken before me at the office of Dayton, Poole & Brown, at No. 225 Dearborn street, in the city of Chicago, Illinois, at the request of the complainant in said cause and pursuant to the notice.

That said witness was by me first duly sworn to testify the truth, the whole truth, and nothing but the truth, in said cause, and said witness was examined by Edward Taggart, Esq., counsel for said defendant, and the testimony of said witness was reduced to writing in the presence of said witness and the counsel therein noted as present, and said testimony was read over by said witness and by him subscribed as and for his deposition in said cause.

And I do further certify that I am neither attorney nor of counsel for any of the parties in said deposition or caption named, and am in nowise interested in the result of said cause.

In testimony whereof I have hereunto set my hand and affixed my notarial seal this 16th day of November, 1889.

LIZZIE CLARK,
Notary Public. [SEAL.]

175 *Testimony in Rebuttal.*

In the United States Circuit Court for the Western District of Michigan, Southern Division.

THE BELDING MANUFACTURING COMPANY, Complainant, *vs.* THE CHALLENGE CORN PLANTER COMPANY, Defendant. } In Equity. No. 963.

Met pursuant to notice at the offices of complainant's solicitors, Poole & Brown, Temple court, Chicago, Illinois, on Tuesday, January 28, 1890, at 2 o'clock in the afternoon, to take testimony in rebuttal on behalf of said complainant, before me, P. H. T. Mason, notary public, in pursuance of stipulation, to be read in evidence for and on behalf of the complainant at the hearing of the above-entitled cause.

Present: Taylor E. Brown, Esq., counsel for complainant, and Edward Taggart, Esq., counsel for defendant.

And thereupon the following proceedings were had:

Counsel for complainant here offered in evidence a refrigerator,

and the same is identified with this record as Complainant's Exhibit Howland Refrigerator.

Counsel for complainant offers in evidence a refrigerator, and the same is identified with this record as Complainant's Exhibit Lowe Refrigerator.

Counsel for complainant also offers in evidence a refrigerator stenciled on its front with the word Perfection, and the same is identified with this record as "Complainant's Exhibit Litchfield Refrigerator."

176 And thereupon Mrs. JULIA LITCHFIELD, a witness produced on behalf of the complainant, being first duly sworn, depose and says, in answer to interrogatories propounded to her by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. Please state your name and residence?

A. Mrs. Julia Litchfield; 733 West Monroe street.

Q. 2. State whether or not you have ever purchased a refrigerator, and if so, please state when and of whom you made the purchase?

A. I never purchased one before this one from John Buckley; his number was 308 West Madison, I believe. I purchased it July, 1883.

Q. 3. Please state what circumstance enables you to fix the date you have just given?

A. We moved into the house that we now occupy at that time.

Q. 4. State what kind of a refrigerator you purchased in 1883 of Mr. Buckley?

A. No. 4 Perfection.

Q. 5. Have you that refrigerator in your possession now?

A. I have not.

Q. 6. Could you identify that refrigerator if you now saw it?

A. Yes, sir; I could.

Q. 7. Please examine the three refrigerators here present, and state whether or not either of them is the refrigerator purchased by you of Mr. Buckley in 1883?

A. Yes, I can. This is the one. (Pointing to Complainant's Exhibit Litchfield Refrigerator.)

Q. 8. How long a time did you own this refrigerator?

A. It will be until a week ago yesterday.

177 Q. 9. You have had this refrigerator, then, in your possession from the time you purchased it of Mr. Buckley until a week ago yesterday?

A. Yes, sir.

Q. 10. Please state whether or not this refrigerator has given you satisfaction during the period you have used it?

A. It has given perfect satisfaction.

Counsel for defendant here waives cross-examination.

JULIA LITCHFIELD.

And thereupon Mrs. ELIZA LOWE, a witness produced on behalf of the complainant, being first duly sworn, deposes and says in answer to interrogatories propounded to her by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. Please state your name and residence?
A. Mrs. Eliza Lowe; 731 W. Monroe street.
Q. 2. Have you ever purchased a refrigerator?
A. I have.
Q. 3. State when and of whom?
A. In 1884, I think, May, of Mr. John Buckley.
Q. 4. State what kind of a refrigerator you purchased of Mr. Buckley?
A. A Perfection No. 4.
Q. 5. Have you still that refrigerator in your possession, and if not, what has become of it?
A. I gave it up a week ago.
Q. 6. Was it in use by you from the time you purchased it, in 1884, until you gave it up a week ago?
A. Yes.
178 Q. 7. Please examine the three refrigerators here present, and state whether or not either of them is the refrigerator you purchased of Mr. Buckley in 1884?
A. This is the one purchased of Mr. Buckley in 1884 (pointing to Complainant's Exhibit Lowe Refrigerator).
Q. 8. State whether or not this refrigerator at the time you purchased it had a flat or horizontal bottom to the ice-chamber?
A. It had a flat bottom.
Q. 9. State what circumstances, if any, exist which enables you to fix the date when you purchased this refrigerator of Mr. Buckley as being in the year 1884?
A. We moved into the house in 1883, and bought the new refrigerator when we began to take ice the next spring.

Cross-examination by EDWARD TAGGART, Esq., counsel for defendant:

C. Q. 1. Have you any written memorandum of the date when you moved into the house?
A. I suppose we have the lease. We leased the house from Mr. Litchfield in July, 1883.
C. Q. 2. What time in 1883 did you lease the house?
A. We moved in the 6th of July.
C. Q. 3. Have you a copy of such lease?
A. I haven't. Mr. Litchfield may have it.
C. Q. 4. What was the number of this house?
A. 731 West Monroe street.
C. Q. 5. Have you resided in that house ever since?
A. We have.
C. Q. 6. What changes or alterations have been made, if any, in this refrigerator since you purchased it?

A. It has been patched in the side where it leaked; wooden supports to the ice-rack has been put on.

179 C. Q. 7. What kind of supports did the ice-rack originally have?

A. I can't remember.

C. Q. 8. What was the shape of the guard or strip of mental over the central opening from the ice-chamber into the provision chamber, when you first puchased this refrigerator?

A. I can't tell.

C. Q. 9. Can you tell whether or not the original ice-rack had the corrugated metal table?

A. Yes, it had the corrugated table.

C. Q. 10. Who repaired the refrigeration when it got out of order?

A. A. C. Selleck.

C. Q. 11. Where does A. C. Selleck reside?

A. 753 W. Madison street.

C. Q. 12. How many times has the refrigerator been repaired?

A. Twice. It may have been more than twice.

C. Q. 13. How long after you purchased before it was repaired the first time?

A. I think the first summer.

C. Q. 14. How long after it was repaired first before it was repaired the second time?

A. I can't tell.

C. Q. 15. Was it repaired the second time the same season that you purchased it?

A. I think not.

C. Q. 16. Who repaired it the second time?

A. A. C. Selleck.

C. Q. 17. Can you state what repairs were put upon this refrigerator the first time it was repaired?

A. Well, that ice-plate was strengthened.

180 C. Q. 18. Do you refer in your last answer to the ice table and rack?

A. Yes, I refer to that ice-rack.

C. Q. 19. What repairs were put on it when it was repaired the second time?

A. They repaired the waste pipe, and there were some repairs made in the roof of the provision chamber. That was this summer.

C. Q. 20. What was the object of the repairs which were put on last?

A. To stop it leaking.

C. Q. 21. Who repaired it the last time?

A. A. C. Selleck.

C. Q. 22. Has not the ice-box had the entire bottom portion of it relined since you purchased it?

A. I don't know.

ELIZA LOWE.

And thereupon WALTER M. HOWLAND, a witness produced on behalf of the complainant, being first duly sworn deposes and says, in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. Please state your name, age, residence and occupation.

A. Walter M. Howland; lawful age; I reside at 482 North State street, Chicago; occupation, lawyer.

Q. 2. State whether or not, you have ever purchased a refrigerator, and if so, state from whom and the date of such purchase?

A. On or about the month of January, 1883, I purchased a refrigerator of the Booth & Osgood M'f'g Co., then doing business at the city of Chicago.

181 Q. 3. State whether or not, that refrigerator is still in your possession, and if it is not, state what has become of it, if you know?

A. That refrigerator is not now in my possession. It is the smaller of the two refrigerators that I now see here in this room (indicating Complainant's Exhibit Howland Refrigerator).

Q. 4. Was the refrigerator in constant use from the date of its purchase until delivered for the purpose of being brought to this room?

A. It was, with the exception of the time from May, 1886, until February, 1887, during which time it was in the store-room.

Q. 5. State how you are enabled to fix the date of the purchase of this refrigerator as being about the month of January, 1883.

A. Because I commenced housekeeping in the month of November, 1882, and I bought the refrigerator about two months afterwards, as near as I now remember. I paid for it on the 20th of April, 1883.

Q. 6. State for the information of the court, your experience with the use of this refrigerator, by which I refer to its adaptability for preserving articles of food; whether or not the provision chamber was dry or moist, etc., etc.

A. It was satisfactory. I don't think any complaint was made respecting it by the servants who used it, and I believe that it was always dry in the provision chamber, except last summer, when there was a leak in the waste or drip pipe, which I had repaired.

Q. 7. Since it has been in your possession, has it been repaired other than as indicated in your last answer?

182 A. I had one and perhaps two new ice-racks put in, and when the waste pipe was repaired, I think there was a little hole repaired in the ice-chamber.

Cross-examination waived by counsel for defendant.

WALTER M. HOWLAND.

By agreement, the further taking of testimony is adjourned until Wednesday morning, January 29, 1890, at 10 o'clock in the forenoon.

P. H. T. MASON,
Notary Public.

CHICAGO, *January* 29, 1890.

Met pursuant to adjournment.
Present: As before.

And thereupon CHARLES LUND, a witness produced on behalf of the complainant, being first duly sworn, deposes and says in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?
A. My name is Charles Lund; age forty-nine years; 272 W. Erie street; occupation, packer.
Q. 2. State whether or not you were ever employed by the R. T. Hambrook Manufacturing Company, or by the Booth & Osgood Manufacturing Company, which succeeded the Hambrook Company.
A. Yes, by both.
Q. 3. When did you first enter the employ of the Hambrook Company?
A. In 1878.
Q. 4. Were you continuously employed by that company and the Booth & Osgood Company?
A. Yes.
183 Q. 5. Were you in the employ of the Booth & Osgood Company at the time that it went into the hands of a receiver about November, 1883?
A. Yes, sir.
Q. 6. Did you work for the receiver of the Booth & Osgood Company, and, if so, for how long?
A. I worked there until he stepped out.
Q. 7. State what were your duties when employed by these companies and by Mr. Stanton, receiver.
A. Oversee the packing and do the shipping of the refrigerators.
Q. 8. Where was the factory in which you worked, located?
A. On Clinton street, near Van Buren, fronting on Canal street, Chicago, Illinois.
Q. 9. What style or make of refrigerators was manufactured by the Hambrook Company and by the Booth & Osgood Company during your employment? In answering this question, you may describe the interior construction as fully as you please.
A. I was working for the Hambrook Company, who manufactured the Perfection refrigerator, and later worked for Booth & Osgood, who manufactured the Perfection and changed the interior from pitch bottom to flush bottom.
Q. 10. By the word bottom, do you refer to the bottom of the ice-chamber?
A. To the ice-chamber.
Q. 11. As I understand your answer, then, a refrigerator having an ice-chamber bottom with a pitch toward the center was first manufactured, and after that, refrigerators with an ice-bottom having
184 no substantial pitch toward the center and which you have called a flush bottom, were made. Am I correct in so understanding you?

(Counsel for defendant objects to the question as leading.)

A. Yes, sir.

Q. 12. Give the date, as near as you can, when the change was made from the pitch-bottom to the flat-bottom ice-chamber.

A. In September or November, 1883.

Q. 13. How do you remember that date?

A. By seeing the refrigerator or the model, and by seeing the man working at it.

Q. 14. Had there been any talk that you know of about changing the refrigerator before this time?

A. Yes, sir.

Q. 15. Do you recollect whether this change to a flat-bottom ice-chamber was made before Mr. Stanton was appointed receiver of the Booth & Osgood Company, or not?

A. Yes, before Mr. Stanton stepped in as receiver.

Q. 16. Were there many of these refrigerators with a flat-bottom ice-chamber made in October or November, 1883?

A. Only a few samples.

Q. 17. Were there any refrigerators with the flat-bottom ice-chamber manufactured after Mr. Stanton was appointed receiver?

A. We commenced to manufacture them after Mr. Stanton stepped in.

Q. 18. Do you know whether any pitch-bottom refrigerators were manufactured for sale during Mr. Stanton's time as receiver?

A. Not to my recollection.

185 Q. 19. Please look at the ice-box marked Complainant's Exhibit Lowe Refrigerator, and state, if you know, by whom that box was made.

A. That was made under Stanton as receiver.

Q. 20. Do you know whether or not the lining of the ice-box of the refrigerators with the flat bottom, such as this exhibit, was made by having the pan or bottom soldered to the sides?

A. Sometimes we done it by being short of zinc.

Q. 21. Was the lining of the ice-box made in one piece when you were not short of zinc?

A. No, it was made in three pieces, the front and the back one piece and the two ends separated. The bottom with the front and back was one piece.

Q 22. Where was the waste or drip pipe located?

A. In the center of the back.

Q. 23. Where was that pipe located in the first style made; that is, the style having the pitch bottom?

A. Located in the same place.

Q. 24. Please look at this box exhibit again and then say where the drip-pipe is located.

A. It is located in the center of the front. I may be mistaken. In place of having it in the center of the back, it is placed in the center of the front.

Q. 25. Did you know a man by the name of George R. Hotchkiss?

A. I do.

Q. 26. Did he work for the Booth & Osgood Company and for Mr. Stanton, receiver, while you were there employed?

A. He did.

Q. 27. What was his employment?

A. Salesman.

186 Q. 28. Did he have anything to do with the construction or manufacture of the refrigerators?

A. No, sir.

Q. 29. Who was the superintendent or general foreman of the shops just before Mr. Stanton became receiver of the Booth & Osgood Company?

A. Mr. P. B. Sheridan.

Q. 30. Did he continue in that position afterwards under Mr. Stanton?

A. No, sir.

Q. 31. Who succeeded him?

A. Bob Castle.

Q. 32. Was Castle the foreman of the shop?

A. Yes, sir.

Q. 33. Do you know a man by the name of John F. Volz?

A. I do.

Q. 34. Did he work for Mr. Stanton, receiver, at any time during your employment by Mr. Stanton?

A. He did.

Q. 35. What was his part of the work?

A. He was a draughtsman.

Cross-examination by Mr. TAGGART, counsel for defendant:

C. Q. 1. At what place did you first work for the Hambrook Company?

A. On Desplaines street near Kinzie.

C. Q. 2. In what month and year did you begin work?

A. 1878, in August.

C. Q. 3. Where were the Hambrook refrigerators at that time manufactured?

187 A. Manufactured in the same place, on Desplaines and Kinzie.

C. Q. 4. How long had the Hambrook Company been manufacturing refrigerators when you first began working for them?

(Objected to as immaterial.)

A. Commenced manufacturing when I commenced to work for them.

C. Q. 5. Who had the charge of lining the refrigerators for the Hambrook Company?

A. P. B. Sheridan.

C. Q. 6. Is Mr. Sheridan a tinner?

A. No, he's a draughtsman.

C. Q. 7. Who had charge of purchasing the metal lining for the refrigerators?

A. Mr. John Lewis.

C. Q. 8. Was it a common thing for the company to be short of material for lining the refrigerators?

A. No, only sometimes.

C. Q. 9. Did you ever know of the Hambrook refrigerator having a pieced-up lining for the ice-chamber, similar to the ice-chamber in the Complainant's Exhibit Lowe Refrigerator?

A. Do you mean the bridge over the flue?

C. Q. 10. I mean the entire lining to the ice-chamber.

A. That was made entirely different from that sample. The top over the flue was made connected with the ice-rack.

C. Q. 11. Were all the refrigerators manufactured by the Hambrook Company constructed after the same plan?

A. They were constructed with a pitch bottom.

188 C. Q. 12. Did all the refrigerators manufactured by the Hambrook Company have the same construction?

A. Yes, sir; all with pitch bottom.

C. Q. 13. That is, all the refrigerators with the pitch bottom were constructed alike, were they?

A. Similarly, all alike.

C. Q. 14. How many sizes of refrigerators were manufactured by the Hambrook Company?

A. Fourteen sizes, to my recollection.

C. Q. 15. At what date did the Booth & Osgood Company begin to manufacture refrigerators?

A. I think in 1879, in the spring,

C. Q. 16. Where did the Booth & Osgood Company manufacture refrigerators?

A. In the Springer's building, on Clinton, near Van Buren, fronting to Canal street.

C. Q. 17. What time in the spring did the Booth & Osgood Company commence to manufacture refrigerators?

A. To my recollection, in March.

C. Q. 17½. How long did the Booth & Osgood Company continue to manufacture refrigerators?

A. Till they failed.

C. Q. 18. When did the Booth & Osgood Manufacturing Company fail?

A. In 1883, in the fall, I think it was.

C. Q. 19. When did Mr. George R. Hotchkiss begin to work for the Hambrook Manufacturing Company?

A. In 1880, I think it was; I am not positive.

C. Q. 20. How long did Mr. Hotchkiss work for the Hambrook Company?

A. Till they changed the name to the Booth & Osgood.

189 C. Q. 21. Give the time in years or months, as near as you can remember?

A. 1880, in the fall. Cannot remember the month.

C. Q. 22. How many months or years did Mr. Hotchkiss work for the Hambrook Company, according to your recollection?

A. About five or six months, to my recollection.

C. Q. 23. In what year did the receiver begin to manufacture refrigerators? I refer to Mr. Stanton.

A. In 1883, in the fall.

C. Q. 24. How long did he continue to manufacture refrigerators?

A. I cannot remember the time he stepped out. He manufactured refrigerators up to that time.

C. Q. 25. That is, Mr. Stanton manufactured refrigerators up to the fall of 1883; is that correct?

A. Mr. Stanton was appointed receiver in 1883, in November, I think it was. I am not positive.

C. Q. 26. How long did Mr. Stanton as receiver continue to manufacture refrigerators?

A. Till he stepped out from receiver.

C. Q. 27. When did he step out from receiver?

A. In 1884, in the spring.

C. Q. 28. How many refrigerators like the refrigerator which has been offered in evidence and marked Complainant's Exhibit Lowe Refrigerator, did Mr. Stanton manufacture?

A. I cannot remember the number.

C. Q. 29. Were all the refrigerators manufactured by Mr. Stanton as receiver of the same form and construction as the Lowe refrigerator, here present?

A. Yes.

190 C. Q. 30. Were all the refrigerators excepting the few specimens referred to by you, manufactured by the Booth & Osgood Company, similar in construction to the refrigerators manufactured by the Hambrook Company?

A. Yes, sir, all alike.

CHARLES LUND.

And thereupon GEORGE VICTOR LUND, a witness produced on behalf of the complainant, being first duly sworn, deposes and says in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. George Victor Lund; age fifty-five; residence 153 North Ada street; occupation, cabinet-maker.

Q. 2. State whether or not you were ever employed by the R. T. Hambrook Manufacturing Company; and if so, state when and where.

A. I was employed by Hambrook the first week in April, 1881, in Springer's building, fronting on Canal street, near Van Buren.

Q. 3. What was the business of the Hambrook Company at that time?

A. I was the general trimmer and fitter of refrigerators and everything else, whatever was made.

Q. 4. How soon after your employment in April, 1881, did the Hambrook Company change its name to the Booth & Osgood Manufacturing Company?

A. In January, 1882.

Q. 5. Did the Booth & Osgood Company manufacture refrigerators?

A. Yes, they did,

Q. 6. What kind?

191 A. The Perfection.

Q. 7. What kind of an ice-chamber did the refrigerators have which were manufactured by the Booth & Osgood Company?

A. At the beginning they had these tipping ice-chambers.

Q. 8. Which way or direction did the ice-chamber tip?

A. On the single boxes they tipped to one side; it was the left side; and in the double, in the center.

Q. 9. How long did you work for the Booth & Osgood Company?

A. From that time, 1882, January, when Mr. Booth stepped in, I worked there latter end of July, 1884.

Q. 10. Then you worked under Mr. Stanton, as receiver, did you?

A. I did, sir.

Q. 11. Do you recollect when Mr. Stanton was appointed receiver?

A. It was the middle of November, 1883.

Q. 12. Before Mr. Stanton was appointed receiver, did the Booth & Osgood Company make any refrigerators having the bottom of the ice-chamber in any other position except pitched?

A. Yes, they did.

Q. 13. When and what kind of refrigerators did they make?

A. They commenced to make flat bottom before Mr. Stanton was appointed receiver; that is, there was only a few patterns made for to see how it would look and work, and after that they had them tested.

Q. 14. Who worked on these flat-bottom refrigerators?

192 A. Well, there was old Mr. Osgood. He worked on that pattern, and I helped him occasionally.

Q. 15. When were those sample refrigerators made?

A. It was made in September or October; I couldn't tell exactly the month, 1883, and he kept on working on that pattern up in December, 1883.

Q. 16. After Mr. Stanton was appointed receiver, what refrigerators were made?

A. Flat-bottom ice-chamber.

Q. 17. Did you make any with the pitch-bottom ice-chamber, that you know of?

A. Not after Mr. Stanton was appointed receiver.

Q. 18. Do you know George R. Hotchkiss?

A. I do.

Q. 19. Did he work for the Booth & Osgood Company, and for Mr. Stanton, receiver, during your employment?

A. He did sir.

Q. 20. What was his position?

A. Salesman.

Q. 21. Did he have anything to do with changing the refrigerators from a pitch-bottom to a flat-bottom ice-chamber?

A. That I couldn't tell, because old Mr. Osgood, he claimed that they were his own invention.

Q. 22. Please look at the refrigerator marked Complainant's Exhibit Lowe Refrigerator, and then state whether or not the refrigerators made under Mr. Stanton, receiver, were made like it?

A. That is the kind that was made in his time; flat-bottom ice-chamber.

Q. 23. In this refrigerator here present, the partition be-
193 tween the provision chambers is lined with zinc and does not extend up into the ice-chamber, but upon top of that partition there is a piece of wood not lined with zinc which does extend into the ice-chamber through the central opening in the bottom of the ice-chamber. Please examine this refrigerator and say whether this is so?

A. The partitions in refrigerators never was allowed to go up so high as that. Only one inch below the level of the provision-chamber bottom.

Q. 24. Do you mean that the top of the partition came to within one inch of the top of the provision chamber?

A. That is what I mean.

Q. 25. Do you know whether this refrigerator was made during Mr. Stanton's time as receiver?

A. It was.

Q. 26. In this refrigerator the bridge over the central opening is soldered to the front and back of the lining of the ice-box. How was the bridge fastened in the flat-bottom refrigerators made under Mr. Stanton as receiver?

A. At the beginning they had the bridge nailed onto the ice-rack, but that was only a few boxes. After that they didn't use no bridge at all.

Q. 27. What did you use in place of the bridge?

A. A hole was cut in the zinc—in the double boxes, so this opening was in the center, and then the wooden bottom was laid in; there was an opening left for the circulation of cold air and in this zinc bottom, right over the other opening, was a hole cut in the zinc, and the edges turned up an inch and a half to prevent the water from dropping down into the provision chamber.

Q. 28. When did you stop working for Mr. Stanton, receiver?

194 A. It was in the latter end of July, 1884. I quit then.

Q. 29. Did you ever work for the Belding Manufacturing Company?

A. No, sir.

Q. 30. You are a brother of Charles Lund, who testified here this morning, are you not?

A. Yes, sir.

Q. 31. Do you know whether he ever worked for the Belding Manufacturing Company?

A. No, sir; he never did.

Cross-examination by Mr. TAGGART, counsel for defendant:

C. Q. 1. You may state, if you know, why the change was made from the old Hambrook style of the double-inclined bottom pieces

to the ice-chamber, to the flat bottom shown in Complainant's Exhibit the Lowe Refrigerator.

A. Well, they was talking about changing the ice-chamber compartment. Finally, old Mr. Osgood got onto the flat-bottom ice-chamber as an improvement. Why he made that improvement or not, I don't know.

GEORGE VICTOR LUND.

And thereupon, P. B. SHERIDAN, a witness produced on behalf of the complainant, being first duly sworn, deposes and says in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. P. B. Sheridan; age, forty-nine; residence, 1573 Lill avenue, Chicago; occupation, designer and salesman.

195 Q. 2. Where are you engaged in business at the present time?

A. Brunswick-Balke-Collender Co.

Q. 3. Where and by whom were you employed in the year 1883?

A. Booth & Osgood Manufacturing Company. I was superintendent.

Q. 4. What refrigerator was manufactured by that company at that time?

A. What we call the Hambrook Perfection.

Q. 5. Describe the interior construction of that refrigerator.

A. It had a center partition in with a cap on top, and from that there was a cold-air space and a slanting bottom with a perforated board underneath.

Q. 6. In what direction did the bottom of the ice-chamber slant?

A. From the ends to the partition. It was done to get over the Fisher patent and not have a center discharge.

Q. 7. How was the water that accumulated on the bottom of the ice-chamber taken care of?

A. It run into a gutter, and from there to a basin in the front of the cooler and from there to the waste pipe underneath.

Q. 8. During the time of your employment of the Booth & Osgood Company, were there any other refrigerators manufactured?

A. Yes, there were two of the flat bottom to the ice-chamber, one single-door and one double.

Q. 9. By whom were they made?

A. By Mr. Isaac Osgood; he only made the flat bottom

196 and I constructed the body. He done all the experimenting himself, testing it for several weeks with ice. In the rear of the office or in the shipping-room he did the experimenting with ice.

Q. 10. When were these two refrigerators made?

A. In the Canal-street factory. It was June or July, as I left their employment on the 8th of August, 1883.

Q. 11. You are positive that the two flat-bottom boxes constructed by Mr. Osgood were made before you left the employ of the Booth & Osgood Company, August 8, 1883, are you?

A. Yes, sir.

Q. 12. In changing the bottom from the inclined to flat, what was done with the troughs which carried the water to the pan in front?

A. They didn't need any. They used a corrugated galvanized iron ice-rack. The troughs were taken away.

Q. 13. In the flat-bottom box, how was the water prevented from running through the central opening and into the provision chamber?

A. There was a flange raised up around the opening.

Q. 14. A raised-up flange in place of the trough, is that it?

A. Yes, sir.

Cross-examination by Mr. TAGGART, counsel for defendants:

C. Q. 1. Please to describe the single-door Hambrook refrigerator manufactured by the Booth & Osgood Manufacturing Company.

A. It had a slanting bottom, generally running to the right-hand end, for cold air to discharge; cap over same. Gutter and basin same as on double-door.

197 C. Q. 2. Will you describe a little more fully the arrangement of the warm-air flue and the cold-air flue in the single-door refrigerator of the Booth & Osgood Company?

A. The hot-air flue was at one end and the cold-air flue at the other end.

C. Q. 3. What was the trouble with the Fisher patent referred to in your direct examination?

A. In the first place, I was the designer of the refrigerator. We made up some of them, and Mr. Hambrook put in this slanting bottom and also perforated board; that's how we come to get the patent on it. Then Fisher notified them that he put an injunction to stop them making. The patent was not then issued; it was only patent applied for. Then he changed and put in a central partition, so as to not have a center discharge. That was the last we heard of it.

C. Q. 4. Are you sure that it was the Fisher refrigerator that your company was afraid of, or was it not the Smith refrigerator, manufactured by the Alaska Refrigerator Company, formerly the Smith Refrigerator Company, of Michigan City, Indiana?

A. I am not positive. It was a refrigerator that had a central opening.

C. Q. 5. You may state, if you know, why the Booth & Osgood Company was desirous of substituting the flat bottom in place of the double-inclined bottom, as manufactured by the Hambrook Refrigerator Company?

A. Because they thought it would be cheaper, and take up less room in the ice-chamber.

Redirect examination by Mr. TAYLOR E. BROWN, counsel for complainant:

R. D. Q. 1. Did the flat-bottom refrigerators made by Mr. Osgood have a discharge opening for the cold air at the center of the ice bottom?

198 A. Yes.

R. D. Q. 2. How far up or in that central opening did the partition between the provision chambers extend?

A. I don't know. I never made any of them.

R. D. Q. 3. Please examine the refrigerator marked Complainant's Exhibit Lowe Refrigerator, looking at the construction of the bottom of the ice-chamber and the partition in the provision chambers, and then state how that exhibit differs, if it does, from the double-door refrigerators with a flat-bottom ice-chamber made by Mr. Osgood?

A. No, there is no difference.

P. B. SHERIDAN.

And thereupon a recess was taken until this afternoon, at 2.30 o'clock.

And thereupon JOHN LEWIS, a witness produced on behalf of the complainant, being first duly sworn, deposes and says in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. John Lewis; age thirty-five; residence, Belding, Michigan; occupation, assistant treasurer of Belding Manufacturing Company.

Q. 2. You have testified before in this case?

A. I have.

Q. 3. In your previous deposition you have testified regarding certain changes being made in the year 1881 or 1882 in the refrigerator manufactured by the R. T. Hambrook Manufacturing Company. At the time those changes were made, you may state what was the construction of the bottom of the ice compartment?

199

A. It was inclined to the center with gutters to catch the drip at the bottom of each incline with a cap or deflecting plate covering the opening for the cold air to go down into the provision chamber.

Q. 4. When was the change made from that construction to the flat-bottom ice-chamber construction, similar to the boxes now made by the Belding Company?

A. In 1883, but not put on the market until the spring of 1884.

Q. 5. What reason have you for stating that the change to the flat-bottom construction was made in 1883?

A. Since my former declaration I have been looking into the matter and find that the changes in 1881 and 1882 were not to the flat bottom. I was under the impression that they were, but now I am satisfied that in 1881, the change made was to line the provision chamber with zinc. Previous to that time they had only been lined with wood. In 1882 we substituted a metal ice and provision rack and lined the under side of the inclined bottom of the ice-chamber, and in 1883 we changed to the present construction, which is the flat bottom.

Q. 6. Do you recollect when the first flat-bottom refrigerators were made and by whom?

A. They were made, I think, in July or August, 1883, under the superintendence of Mr. Isaac Osgood.

Q. 7. What style of refrigerator, with respect to the ice compartment, was made during Mr. Stanton's time as receiver of the Booth & Osgood Company?

A. The flat bottom, the same as the Belding Manufacturing Company makes now, except that I think the ice-bottom was sup-
200 ported on cleats nailed to the front and back of the box, and the pieces composing this ice-bottom were not matched.

Q. 8. Please examine the exhibit marked Complainant's Exhibit Lowe Refrigerator, and identify the same, if you can?

A. That refrigerator was made in the early spring of 1884.

Q. 9. The bottom portion of the lining to the ice-chamber appears to be soldered to the two end pieces and the front and back piece of the lining. Is the present appearance of that box in this respect due to alterations therein since the date of its manufacture, or not?

A. It is not due to any alteration, but it has evidently been repaired and by a man who did not know how to put in the bottom. There is an alteration made in raising the partition above the ice-bottom and soldering on a cap or deflecting plate. This was not done when the refrigerator was new, but the seam around the box near the bottom may have been made so as to save zinc or use the smaller pieces.

Q. 10. In how many pieces or parts was the lining of the ice-chamber made when constructed; the flat-bottom boxes?

A. Usually eight pieces, but sometimes in order to save zinc, we soldered pieces together to make the right size.

Q. 11. In this exhibit there appears to be a piece of wood unlined, placed upon the top of the partition between the provision chamber and extending up through the opening in the bottom of the ice-chamber. Was it the custom to manufacture flat-bottom refrigerators with that piece in as shown in this exhibit?

A. It was not.

201 Q. 12. With the exception of the differences which you have mentioned, were all the refrigerators manufactured under Mr. Stanton as receiver, similar to the Complainant's Exhibit Lowe Refrigerator?

A. It is possible that a few of them, which had been carried over from the previous season in the knock-down, were finished with the inclined bottom, but after they were made all the balance of the year's output were made the same as this exhibit. There would not be exceeding one or two hundred, if any, with the inclined bottom.

Q. 13. Was there a new stencil purchased for use at the factory in Belding, in December, 1885, or about that date?

A. I don't remember.

Q. 14. Did the Belding Company put in any new boilers and engines at Belding in the year 1885?

A. They did.

Q. 15. Do you know Silas M. Brown, of Grattan, Michigan?

A. I do, but think his name is Sidney M. Brown.

Q. 16. Was he ever employed in the packing-room at the Belding factory?

A. He was.

Q. 17. Do you know when he left the employ of the Belding Company?

A. I think it was 1886 or 1887, in the summer.

Q. 18. Did he leave voluntarily, or was he discharged?

A. I believe he left voluntarily to go to Dakota.

Q. 19. When did George R. Hotchkiss visit the Belding factory in 1884?

A. The latter end of October, I think.

202 Q. 20. And how long did he remain?

A. Six or seven weeks.

Q. 21. Was he there all the time during that period?

A. He was not.

Q. 22. What was his business at the factory at that time?

A. The first part of the time he was making himself generally useful, and the latter part of the time he was looking over the finish and the trimming of the boxes, and was making suggestions that he thought would suit his customers. One of the first jobs that he did in company with myself was to fill the dry kilns with two-inch plank.

Q. 23. Who was the superintendent of the factory at that time?

A. F. E. Ranney.

Q. 24. Did Mr. Hotchkiss, during his visit at Belding, direct the construction of the refrigerators, changing them from an inclined ice-bottom to a flat ice-bottom?

A. Certainly not.

Q. 25. Had the Belding Company manufactured any flat-bottom refrigerators prior to Mr. Hotchkiss' appearance at Belding in 1884?

A. They had not completed any, but they had cut out a lot of them; the stock bills were all made; the forms were all changed, and the design and all particulars were decided upon. The factory had been running nearly a month, and it was not started until we knew what we were going to make.

Q. 26. Do you know Arthur W. Ranney?

A. I do.

Q. 27. He worked for the Belding Company in 1884, did he not?

203 A. He did.

Q. 28. Did you ever put him in charge of the shops as foreman?

A. Certainly not. I had no authority to do so. That was the superintendent's business.

Q. 29. State, if you know, the number of Hambrook refrigerators put upon the market prior to the change to the flat-bottom ice compartment.

A. To the best of my recollection, it was about ten thousand.

Q. 30. State whether or not those refrigerators gave satisfaction to the customers, basing your answer somewhat upon the number

of inclined-bottom refrigerators which may have been returned to the factory by complaining customers.

A. I believe they were very satisfactory. I know several parties now who have them in use still and claim they are the best they ever saw. The returns on complaints do not amount to anything near one-tenth of one per cent. The first few years we consigned a good many of our goods to the dealers and they returned what they did not sell at the end of the season, but we heard very few complaints of the working of the refrigerators.

Q. 31. How many of the old-style refrigerators were returned after the company began the manufacture and sale of those having a flat-bottom ice-chamber, which were converted or made over into the flat-bottom box?

A. I don't know of any.

Q. 32. As book-keeper, you would have known of such returns, had any been made, would you not?

A. I should. There were some five or six returns to us at Belding by Standart Brothers, of Detroit, to be repaired, but to
204 the best of my knowledge and belief, those refrigerators were made by the receiver of the Booth & Osgood Manufacturing Company and consequently were flat-bottom boxes. I base my opinion in part upon the fact that Standart Brothers did not carry any refrigerators over 1883, but they did in 1884, and the boxes were so poorly made in 1884 that they were sent back for repairs. It was a stipulation when they gave their order in 1885 that we should make those good.

Q. 33. Was Arthur W. Ranney discharged from the employ of the company, or not?

A. He was—or rather he was given the option of taking less pay or quitting.

Q. 34. Do you know a tinsmith named John C. Martin?

A. I do.

Q. 35. Did he ever work for the Belding Company?

A. He did; from some time in December, 1884, to November or December, 1885.

Q. 36. Did he leave voluntarily or was he discharged?

A. I understand he had some trouble with Mr. Ranney, but I was in New York at the time and have not seen him since, so cannot speak of my own knowledge.

Q. 37. About how many refrigerators having a flat ice-bottom were manufactured in 1884 by Mr. Stanton, as receiver?

A. About 3,300, one or two hundred of which were carried over to the next season.

Cross-examination by Mr. TAGGART, counsel for defendant:

C. Q. 1. What are your duties as assistant treasurer of the Belding Manufacturing Company?

A. Keeping the books, keeping the account of all the money,
205 in addition to which I keep the stock, keep it replenished and keep an account of all the refrigerators made and sold,

collect all accounts, remit to the treasurer, make out all drafts in payment of the accounts.

C. Q. 2. What were your duties in 1884 when the Belding Company first began the construction of refrigerators?

A. I kept the factory books, helped around anywhere I was wanted, scaled the lumber, ran some of the machines, swept out the shop, and started and superintended the packing.

C. Q. 3. How long did you act as superintendent of the factory?

A. Not at all. The packing, I said.

C. Q. 4. How long did you superintend the packing?

A. Until some one else was broken in who could do it.

C. Q. 5. Have you any memorandum from which you can tell the date that Mr. George R. Hotchkiss began work at Belding, in the fall of 1884?

A. Not with me.

C. Q. 6. Have you any memorandum from which you can tell the date that Mr. Martin began work at Belding, in 1884?

A. Not with me. I could tell by referring to the old books.

C. Q. 7. Where was the refrigerator which has been offered in evidence as Complainant's Exhibit the Lowe Refrigerator, manufactured?

A. In Chicago, Springer building, South Canal street.

C. Q. 8. How does the refrigerator, referred to in your last answer, compare, in size and proportion, with the No. 4 refrigerator now manufactured by the Belding Manufacturing Company?

206 A. It is one and three-eighths inches shorter. Otherwise, I believe it is the same.

C. Q. 9. How does the so-called Lowe refrigerator compare in size with the No. 4 refrigerators manufactured by the Booth & Osgood Manufacturing Company?

A. The body of the box is the same size, but the projections are not as much. Consequently the outside dimensions would be measured as less.

C. Q. 10. When was the change in the outer construction of the box made from the form used by Booth & Osgood to the form used by the receiver.

A. During the spring of 1884.

C. Q. 11. Of the ten thousand refrigerators manufactured in accordance with the Hambrook construction, as referred to by you in your direct examination, how many were made by the Hambrook Manufacturing Company and how many by the Booth & Osgood Manufacturing Company?

A. I can't tell, but I should think from three to four thousands were made by the R. T. Hambrook Manufacturing Company, and the rest of them by the Booth & Osgood Manufacturing Company. The R. T. Hambrook Manufacturing Company did not offer any for sale outside of the city of Chicago; consequently their sale was less.

C. Q. 12. Will you please describe the Hambrook refrigerator, manufactured by the Booth & Osgood Manufacturing Company, which contained the single door to the provision chamber?

A. It was the same as half the double door.

C. Q. 13. That is, it was the same as the half of the refrigerator containing the double door?

A. It was.

207 C. Q. 14. How many of the refrigerators of the Hambrook style, manufactured by the Booth & Osgood manufactory, contained the single door?

A. I don't know.

C. Q. 15. Please approximate the number as near as you can?

A. Well, I should say about two-thirds of a single door.

C. Q. 16. What percentage of the Hambrook refrigerators, manufactured by the R. T. Hambrook Company, contained the single door?

A. I think about the same.

C. Q. 17. Was you aware of the fact that the Hambrook Company was threatened with suit or actually sued by the company which manufactures the Smith refrigerator, sometimes called the Alaska refrigerator?

A. I was.

C. Q. 18. Was you a witness in such suit?

A. I was not.

C. Q. 19. When was such suit brought?

A. I don't think it was brought at all, but only threatened.

C. Q. 20. At what time in the year 1884 did the Belding Manufacturing Company begin the manufacture of refrigerators?

A. The end of September or the first of October. They began to cut them out the end of September.

C. Q. 21. What time in 1884 did the receiver of the Booth & Osgood Manufacturing Company cease from manufacturing refrigerators?

A. I cannot say for certain, but should think in June or July.

208 C. Q. 22. What number of refrigerators, if any, were turned over by the receiver to the Belding Manufacturing Company?

A. I don't know how many, but think it was somewhere over a hundred. They were turned over in Chicago and I was in Belding, and the books at that time were kept in Chicago. Consequently I don't know much about it.

C. Q. 23. Did the receiver put out a refrigerator catalogue for the season of 1884?

A. I think he did, but am not sure that he didn't use the year's before catalogue, and stamped it "W. A. Stanton, receiver." I know they used a few this way, but don't know whether they afterwards got new ones. I don't recollect.

C. Q. 24. Can you state what changes in the sizes of the refrigerator were made by the Belding Manufacturing Company?

A. They were all made an inch to an inch and a half longer to make them live up to the old Booth & Osgood Manufacturing Company's catalogue and still use the smaller projections.

C. Q. 25. Was there any change in size of the corresponding num-

ber of refrigerators, from the old Booth & Osgood catalogue, or from the old Hambrook catalogues?

A. I think not, except in the number 5 and the number 6, in which the style was changed from a lift lid to an open ice front.

C. Q. 26. Was there any change made in the style and outward appearance of the refrigerator? I refer to the changes made by the Belding Refrigerator Company from the styles previously used?

A. The base of the refrigerator which had previously been
209 plain, the Belding Company beaded and put a cherry molding at the top. The ends, which previously had three horizontal panels, were changed so as to have one horizontal and two perpendicular panels; the lid shut onto a cherry bed-molding; the stiles on the front were widened, and had a cherry bracket at the top; the doors were made to overlap instead of shutting, as they had up to that time.

C. Q. 27. At whose instigation or suggestion were these various changes made?

A. It was talked over between Mr. H. H. Belding, Mr. F. E. Ranney, Mr. Herman Driese and myself, in the upper floor of the old factory, the latter part of September, 1884, and then it was all decided upon.

C. Q. 28. Did Mr. Hotchkiss have any suggestion to make whatever in regard to the construction or ornamentation of the refrigerator?

A. Not on the body of the refrigerator, but he did suggest that we use certain moldings, and put them on in certain manners, certain hardware, etc., trimmings, that, from his knowledge of the trade, he thought would help sell the goods.

C. Q. 29. How did the price of refrigerators sold by the Hambrook Company compare with the prices of refrigerators sold by the Belding Company?

A. I think the list was the same, but there might have been some variations in the discounts.

C. Q. 30. Do you think that the refrigerator was improved or its usefulness increased by the change from the double-inclined bottom of the Hambrook to the flat bottom of the Lowe refrigerator?

A. I think that the old Hambrook refrigerator, made in
210 1883, was much better than those made in 1884, because those made in 1884 were not constructed properly. The ice bottom was not solid enough.

C. Q. 31. Do you know of any of the refrigerators made in 1884 having come back to the factory for repairs?

A. I think that there was some returns, as I stated before, from Standart Bros. I know that one was returned from the north side to be repaired, and am under the impression that there were several returned from different parts of the city. Further than that, I know that the trade that the Booth & Osgood had held the two or three years previous was lost, with two or three exceptions, on account of the poor quality of the boxes made by the receiver in 1884.

C. Q. 32. Under whose supervision were the refrigerators con-

structed during the time that the company was in the hands of a receiver?

A. Chiefly under Mr. Osgood; but the main fault lay in not knowing how to put in a flat bottom. It was not put in strong enough, as was the case in the Lowe refrigerator, which had to be repaired on that account.

C. Q. 33. Who had the supervision of the construction of the refrigerators manufactured by the Booth & Osgood Manufacturing Company?

A. P. B. Sheridan.

C. Q. 34. When was the form of the Hambrook refrigerator changed from the form which had the bottom of the provision chamber sunk below the bottom of the front doors of the refrigerator, to the form which has the bottom of the provision chamber on a level with the front door of the refrigerator?

A. I think it was in 1880.

C. Q. 35. Upon whose suggestion was such change made?

211 A. I think it was on mine; but I had heard it, so it was not original with me, but was with J. Wallace Childs. He was the first one that I heard speak of it.

C. Q. 36. Was the change in the bottom of the provision chamber one of the changes referred to in your direct examination?

A. No. I had forgotten that.

C. Q. 37. When was the change made from the munton or strip between the front doors, to the form having the overlapping doors without an intervening strip?

A. Some time previous to 1882.

C. Q. 37½. Upon whose suggestion was such change made?

A. I don't know.

C. Q. 38. Was this one of the changes referred to in your direct examination?

A. It was not.

C. Q. 39. When was the form of the lid which overlaps the box introduced?

A. It had always been used on the ice-chests, but was not used on the refrigerators until 1883 or 1884.

And thereupon an adjournment was taken until Thursday morning, January 30, 1890.

P. H. T. MASON,
Notary Public.

CHICAGO, ILL., *January* 10, 1890—10 o'clock a. m.

Met pursuant to adjournment.
Present, as before.

Cross-examination of complainant's witness JOHN LEWIS thereupon resumed:

C. Q. 40. At what time did the Belding Refrigerator Company adopt the metal stay or strip used to prevent the lid from opening too far back?

212 A. In the fall of 1885.

C. Q. 41. Upon whose suggestion was that improvement adopted?

A. I don't know, but it was generally demanded by the trade.

C. Q. 42. What proportion of the refrigerators manufactured by Mr. Stanton, receiver, contained the single door, and what proportion the double door?

A. I think about two-thirds of the single door and one-third double.

C. Q. 43. Did the double-door refrigerators manufactured by Mr. Stanton, receiver, differ from the single-door refrigerators manufactured by the Hambrook Company and by Booth & Osgood Company?

A. I think they did. To the best of my recollection the single-door refrigerators manufactured by the receiver had a central opening for the cold air to pass from the ice-chamber to the provision chamber and the flue at either end for the warm air to pass to the top of the ice-chamber, while the Hambrook Manufacturing Company used the cold-air flue at one side and the warm-air flue at the other.

C. Q. 44. Did the single-door refrigerators manufactured by the receiver have a flat bottom?

A. They did.

C. Q. 45. At what time was the change made from the form shown in Complainant's Exhibit the Litchfield Refrigerator, and Complainant's Exhibit the Howland Refrigerator? I refer to the form of the troughs which conduct the water to the waste pipe and which receives the water from the double-inclined bottom piece.

A. It was decided on in the summer of 1882, and was made in the fall of the same year.

213 C. Q. 46. At what time in 1884 did you go to Belding to work for the Belding Manufacturing Company?

A. On the 15th day of September.

C. Q. 47. Did you remain there continuously through the fall of 1884?

A. I did, except that I might have been gone for a day or two to inspect lumber, but I don't think I went out until after the 1st of January.

C. Q. 48. At what time did the receiver turn over the refrigerators to the Belding Company?

A. I am not sure, but I think it was during the latter end of September.

C. Q. 49. In your direct examination, you refer to utilizing a small piece of zinc for lining the ice-box. Is the zinc lining one of the expensive features of a refrigerator?

A. It is.

C. Q. 50. At what time did the Belding Manufacturing Company adopt what they called the antique finish on the refrigerator?

A. In 1889.

C. Q. 51. At what time did the Belding Manufacturing Company adopt the corrugated-iron ice support?

A. We always used it.

Redirect examination by counsel for complainants:

R. D. Q. 1. I read you Q. 6, and C. Q. 3, and the respective answers thereto of the deposition of P. B. Sheridan, given in this case; and ask you if you have any recollection of any claim being made on the Hambrook Manufacturing Company in regard to the Fisher patent?

214 A. When Mr. Hambrook first got up the patent it was in its present form. Mr. Fisher brought us a letter notifying us that it was an infringement on his patent of 1871, I think, wherein he claimed that the cold air entered the provision chamber at a point below that at which the warm air left it. We then put in the board at the top of the provision chamber, making it so that the warm air left the provision chamber on a level with the point at which the cold air entered it. I think Mr. Sheridan was a little bit mixed, for if I am not mistaken, this was done after the patent was issued. When this change was made, Mr. Fisher expressed himself as satisfied that it did not infringe upon him.

R. D. Q. 2. If I understand your last answer then, the Hambrook Company first made the refrigerators with an interior construction similar to that disclosed in Complainant's Exhibit Howland Refrigerator, and that upon receiving this notice from Mr. Fisher, made its refrigerators with an interior construction similar to Complainant's Exhibit Litchfield Refrigerator. Is that understanding correct?

A. It is, except that the under side of the inclined bottom to the ice-chamber was not lined with zinc. Neither were the provision chambers lined with zinc, and the gutter was single and a little different shape.

Recross examination by counsel for defendant:

R. C. Q. 1. Do you mean to be understood that the Hambrook Refrigerator Company first manufactured refrigerators having a flat bottom instead of a double-inclined bottom to the ice-chamber?

A. I do not. They were first made exactly as the patent drawing shows, but afterwards the piece of board at the top of the pro-

215 vision chamber was added as shown in Complainant's Exhibit Litchfield Refrigerator, and this was done to avoid even the possibility of a lawsuit.

R. C. Q. 2. When did the Hambrook Company adopt the perforated board?

A. Within a few weeks of the time they started to make refrigerators.

R. C. Q. 3. How long did they continue the use of the perforated board?

A. Until the fall of 1882.

R. C. Q. 4. Why was the perforated board then discarded, and at whose suggestion?

A. The majority of our customers wanted the under side of the ice-chamber lined with zinc, and in order to do that we had to leave out the perforated board.

R. C. Q. 5. Did this perforated board subserve any useful purpose, or have any function whatever?

A. No, except as stated before, to satisfy Mr. Fisher. That was all it was for.

JNO. LEWIS.

And thereupon, ALBERT M. OSGOOD, a witness produced on behalf of the complainant, being first duly sworn, deposes and says, in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. Albert M. Osgood; age forty-six years; residence, Chicago, Cook county, Illinois; occupation superintendent of the Bensinger Cash Register Company.

Q. 2. Were you connected with the Booth & Osgood Manufacturing Company of Chicago; and if so, how?

216 A. I was connected with them; occupied the position as treasurer and general manager.

Q. 3. What was the business of that company in the years 1883 and 1884?

A. Manufacturing school furniture, refrigerators, bank-work, file cases, and general line of wood-work.

Q. 4. What style of refrigerator did your company manufacture?

A. Manufactured under the style called the Perfection, a central discharge with flue on the double doors at each end, known under the Hambrook patent.

Q. 5. Describe the position of the ice-chamber in the refrigerators manufactured in the year 1883?

A. With an inclined bottom, upturned edge, with the hot-air flues at each end.

Q. 6. Were you connected with the company after it passed into the hands of Mr. Stanton as receiver?

A. I was.

Q. 7. Please look at the ice-box marked Complainant's Exhibit Howland Refrigerator, and state how it compares, in its interior construction, with the boxes manufactured by the Booth & Osgood Company in 1883?

A. I think that box was made before 1883. The inclined bottom and upturned edge is about the same. The difference, to my recollection, is, that we put underneath the bottom of those goods made in 1883, a thin piece of whitewood, thereby forming an extra air chamber underneath the ice receptacle. Otherwise than that, I think they are the same.

Q. 8. After the company passed into Mr. Stanton's charge as receiver, what style of refrigerator was then made?

217 A. On or about July or August, in the year 1883, we made in the factory, I think the No. was 219 S. Canal street, known as the Springer building. It was near the corner of Van Buren and Canal streets, two refrigerators; one a single and one a double door, with the flat bottom in the ice-chamber, and so constructed that it

could be knocked down. That was to enable us to ship in large quantities at a reduced rate in freight. The discharge is the same, with the hot-air flues at the end, and my recollection is, that the coming season after Mr. Stanton took hold, we manufactured those goods with the flat bottom, but not known as the knock-down refrigerator.

Q. 9. Please examine the box marked Complainant's Exhibit Lowe Refrigerator, and state how it compares in the construction of the ice-chamber with the refrigerators made by the Booth & Osgood Company after Mr. Stanton's appointment as receiver.

A. They are the same.

Q. 10. What was your position in this company after Mr. Stanton's appointment as a receiver?

A. I continued right along in the same position as I had with the Booth & Osgood Company with the exception of the finances. I bought all of the stock, hired all the help, made collections and accounted to Mr. Stanton for them.

Q. 11. About how many refrigerators having the flat bottom to the ice-chamber with a central discharge opening therein, surrounded by an upturned edge, were manufactured after Mr. Stanton's appointment as receiver?

A. My recollection of it is somewheres about two thousand.

Q. 12. Are you acquainted with George R. Hotchkiss, formerly in the employ of the Booth & Osgood Company?

218 A. I am. I employed him to sell refrigerators for the Booth & Osgood Manufacturing Company, and he remained in the employ of said company up to the time a receiver was appointed.

Q. 13. State whether or not Mr. Hotchkiss had anything to do with the manufacture of the refrigerators or the designing of them.

A. No, sir, he did not.

Q. 14. State, if you know, under whose direction the two boxes having the flat ice-bottom were made in the summer of 1883.

A. Under Mr. I. Osgood's supervision.

Q. 15. State whether or not Mr. Hotchkiss had anything to do with designing or constructing either of these two refrigerators.

A. No, sir.

Q. 16. After the appointment of Mr. Stanton as receiver, did Mr. Hotchkiss continue in his employ?

A. He did not for some little time. On or about January the 9th I obtained Mr. Stanton's consent to telegraph to Mr. Hotchkiss to come to Chicago, which he did, and arrangements were made with him whereby he went on the road selling refrigerators.

Q. 17. When did he cease to be employed by the Booth & Osgood Company?

A. I think I stated in previous testimony that he remained in their employ up to the time of an appointment of a receiver, and a receiver was appointed, to my recollection, in the fore part of November, 1883.

Q. 18. When were the refrigerators manufactured which were sold by the receiver in the spring of 1884?

A. I think some of the refrigerators with the ice-chamber
219 having an inclined bottom and upturned edge were manufactured during 1883, but the goods manufactured after a receiver was appointed were with the flat bottom.

Q. 19. Were there many refrigerators having an inclined bottom to the ice-chamber, in stock at the date of the appointment of the receiver?

A. My recollection in regard to that matter is that something from 800 to 1,000 of refrigerators and parts of refrigerators were on hand, and those were completed by order of the receiver. My recollection is that there were from 3,300 to 3,500 sold that year; the balance of goods were made up of new stock. What I mean to be understood by that is, the balance of the goods sold over the 800 to 1,000.

Q. 20. And these that you have called new stock were constructed with a flat bottom to the ice-chamber, as I understand you? Is that right?

A. Yes, sir.

Q. 21. What is your recollection regarding the making of a special flat-bottom refrigerator that was sent to the Cincinnati exposition, during Mr. Stanton's management as receiver?

A. I don't recollect any special refrigerator being made for the Cincinnati exposition. Wherever we sent out samples of refrigerators, we sent out the flat bottom, as we intended that to be the style that we should put upon the market right along.

Q. 22. Do you know whether Mr. Hotchkiss constructed or had constructed, a special refrigerator having a flat bottom to the ice-chamber at any time during his employment by the Booth & Osgood Company or by Mr. Stanton as receiver?

A. Not to my knowledge.

220 Q. 23. Was your position such that you would have known of it, had Mr. Hotchkiss been so engaged?

A. I certainly should have known it had such a refrigerator been constructed in the factory of the Booth & Osgood Manufacturing Company or by any one connected in the factory under the management of W. A. Stanton as receiver for said company.

Cross-examination by counsel for defendant:

C. Q. 1. Were the flat-bottom refrigerators manufactured by Mr. Stanton, receiver, a good and successful refrigerator?

A. They were so considered, sir.

C. Q. 2. What became of the two refrigerators which were manufactured under the Booth & Osgood Company, which contained the flat bottom?

A. My recollection is that they were sold during the season after Mr. Stanton was appointed receiver.

C. Q. 3. What was the size of each of such refrigerators?

A. One size known as No. 3, double door. My recollection is that the other was either No. 7 or 8, single door.

C. Q. 4. Did these two refrigerators correspond in size with the sizes given in the Booth & Osgood catalogue for 1883?

A. My recollection is that the outside known as the outside case of the numbers specified in previous testimony, were taken, and the inside ice-chamber was placed in said cases.

C. Q. 5. You stated that such refrigerators were made so that they could be shipped in the knock-down. Were they so shipped?

221 A. I don't think they were.

C. Q. 6. When were they permanently put together before they were shipped?

A. I think I stated before that the two refrigerators were made in July or August, 1883, and they were completed at that time. Whether they were taken apart to show the device after that or not, I cannot state.

C. Q. 7. Do you remember whether or not such refrigerators were tested by the use of ice in order to ascertain whether they would work practically or not?

A. I recollect of our taking the two kinds of refrigerators and testing them with a thermometer, and as far as the number of degrees shown, they were about the same. A very little difference.

C. Q. 8. For how long a time were these first two flat-bottom refrigerators tested?

A. My recollection is that we were testing the refrigerators from a month to six weeks.

C. Q. 9. Where were these tests carried on?

A. Both in the rear of the office, in a separate building from the factory on Canal street, and I also think they were tested in the factory after they were put up by the cabinet-maker, and he was located in the southeast corner of the factory on the third floor.

C. Q. 10. Who conducted the tests?

A. I think Mr. Lewis, Mr. I. Osgood, as well as myself.

C. Q. 11. Are you at all positive when these two refrigerators were sold, or that they were ever sold at all?

A. My recollection is that during the spring of 1884, and on account of not having been able to get a stock of refrigerators on hand of the different sizes owing to the financial trouble of

222 the company, that we were unable to fill our orders; when I say we, I mean W. A. Stanton, receiver, and that those goods were sold during that spring.

ALBERT M. OSGOOD.

Counsel for complainant offers in evidence a printed pamphlet purporting to be a description and price-list of refrigerators manufactured by Booth & Osgood Manufacturing Company and identifies the same with this record as "Complainant's Exhibit Booth & Osgood 1883 Catalogue."

And thereupon, upon consent of counsel for the respective parties hereto, the further taking of testimony in rebuttal on behalf of the complainant was thereupon adjourned until Tuesday, February 4, 1890, at 10 o'clock in the forenoon, at the office of Poole and Brown, Chicago, Illinois.

P. H. T. MASON,
Notary Public.

CHICAGO, *Feb.* 4, 1890.

Met, pursuant to adjournment.

Present: Taylor E. Brown, Esq., counsel for complainant.

And thereupon an adjournment was had until Wednesday, February 5, 1890, at 10 o'clock in the forenoon.

P. H. T. MASON,
Notary Public.

223 CHICAGO, *February* 5, 1890.

Met, pursuant to adjournment, 10 o'clock a. m.

Present: Taylor E. BROWN, Esq., counsel for complainant, and Edward Taggart, Esq., counsel for defendant.

And thereupon MELVILLE E. DAYTON, a witness produced on behalf of complainant, was recalled, and in answer to interrogatories propounded by counsel for complainant, testified as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. Melville E. Dayton; age, fifty-four years; residence, Chicago, Illinois; occupation, mechanical expert and solicitor of patents.

Q. 2. Have you before testified in this case?

A. I have.

Q. 3. Please examine Defendant's Exhibit Banta Patent No. 60665, of 1867; Defendant's Exhibit Koch Patent No. 77624, of 1868; Defendant's Exhibit Chase Patent No. 95428, of 1869; Defendant's Exhibit Little Patent No. 129,671, of 1872; Defendant's Exhibit Harris Patent No. 61734, of 1867; Defendant's Exhibit Law Patent No. 62643, of 1867; Defendant's Exhibit Page Patent No. 175,143, of 1876; Defendant's Exhibit Rohrer Patent No. 121,899, of 1871; Defendant's Exhibit Yost Patent No. 23803, of 1859; Defendant's Exhibit Hunt Patent, reissue 4789, of 1872; Defendant's Exhibit Butler Patent No. 161,928, of 1875; Defendant's
224 Exhibit Lyman Patent No. 14510, of 1856; Defendant's Exhibit Smith Patent No. 193,563, of 1877; Defendant's Exhibit Smith Patent, reissue No. 3463, of 1878; Defendant's Exhibit Sanford Patent No. 13802, of 1855; Defendant's Exhibit Sanford Reissue Patent No. 455, of 1857, as well as Defendant's Exhibit Page Model and Defendant's Exhibit Rohrer Model, and compare said exhibit patents and said model exhibits with Complainant's Exhibit Hambrook Patent No. 204,216, and state whether or not, in your opinion, the invention described and claimed in said Hambrook patent is found in or suggested by anything contained in either of said defendant's exhibits, giving your reasons for the opinion you express.

A. I have examined the patents, exhibits and models referred to in the question and reply that I do not find in either of them the invention or suggestion of the invention, set forth in complainant's Hambrook patent.

Said exhibits illustrate various forms of refrigerators and of refrigerating devices to be used in apartments or cooling-rooms, and present several individual elements or features, corresponding more or less with certain individual features in the Hambrook patent.

But said Hambrook patent is not for either of the individual elements or features therein shown, considered by itself, but is for a combination of elements arranged with respect to each other substantially as described and shown and, in such arrangement, going to form a refrigerator, having a certain mode of operation and possessing certain advantages set forth in the second paragraph of the patent. In other words, the Hambrook patent is not broadly for the idea or discovery that cold air is heavier than warm air and will fall by its greater specific gravity and thus cause the
225 warmer air which it displaces, to rise; nor is it for the general location of an ice-chamber above a provision chamber by which the difference in specific gravity between cold and warm air may induce a circulation; nor is it for a particular form of grate or support on which the ice may rest while allowing air to move downward in contact with the ice; nor is it for the idea of inclining a water shed in order to permit water to flow therefrom; nor is it for the provision of an air passage or passages broadly, by which air may descend from the ice-chamber, or ascend from the provision chamber. All these things, broadly considered, were well known in various forms at the date of the Hambrook invention. What Hambrook invented and desired to accomplish are set forth in said second paragraph of his patent, which I again quote as follows:

"The nature of my invention consists in the construction of a refrigerator having the ice-chamber constructed in such manner that the air will impinge upon the top, bottom and sides of the ice, and that the continuous volume of cold air generated by the melting of the ice will descend, in a dry state, to the provision chamber without material hinderance, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending current of cold air."

I fail to find in any of the references or exhibits referred to in the question, a refrigerator having the construction here referred to by the patent or adapted to accomplish so well, the objects here set forth by the patent.

The movements of air currents under the impulse of a dif-
226 ference in specific gravity between portions of the body of air to be moved, when such difference is produced by the presence of a heat absorbent (like a body of ice), are dependent oftentimes on very delicate causes, or slight changes in the construction or arrangement of the air passages. Among the principal objects specified by the patentee are the delivery of the air, "in a dry state," into the provision chamber, and the movement of the air "without material hindrance," as it descends into the provision chamber, and its ascent from the provision to the ice chamber, "without meeting the descending current of cold air." These objects are unquestionably obtained by the construction shown in the Hambrook patent, and it is immaterial to the attainment of these objects whether certain individual and minor elements, which enter into the refrigerator, are of the precise form shown in the patent or are of either one or another of the several older forms of the same individual elements, shown in the prior art, and which were open to selection by

the builder under the Hambrook patent. I mean of course—provided said older forms of such individual elements have the same general features or characteristics, so that when employed in the Hambrook refrigerator, they will give essentially the same combination in the entirety, the same mode of operation and the same results.

The finding in the prior art therefore of an ice-rack like that shown in the Hambrook patent, in my judgment, cuts no figure, as an anticipation of the Hambrook invention, nor on the other hand, is Hambrook, in my judgment, limited to the use of the particular form of ice-rack which he shows, but he is at liberty, so long as he preserves the distinctive and essential features of his invention, to use any of the old forms of ice-racks presented in the prior art, and which is therefore the full equivalent of that illustrated by him. The same is true, in my judgment, of the horizontal partition which divides the ice-chamber from the provision chamber, the essential feature of which is not that it or its parts, are inclined in a particular direction to shed the water, but that it is centrally divided and is inclined in some suitable way and provided with troughs or their equivalents in some suitable form, by which the water will be carried off out of the refrigerator and not allowed to fall into the provision chamber.

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So also with respect to the deflecting plate over this central opening of the said horizontal partition. This is necessarily some form of plate or deflector placed over said central opening, so that the dripping from the ice which would otherwise pass through said opening, shall be delivered upon the partition, whence it may escape without entering the provision chamber. A trough under the central opening to catch such dripping, as well as the water delivered from the horizontal partition, is not such a superposed deflecting plate. The deflecting plate is in keeping with the general purpose to prevent the entrance of moisture into the provision chamber and the trough is not; for, the latter being in the provision chamber, involves the passage of air in its descent through a dripping body of water, and it also involves the condensation of water on the bottom of the trough, which drips therefrom directly into the provision chamber. Besides, a trough beneath the central opening of the horizontal partition, is a deflecting plate for the air tending to send the same off horizontally and to prevent its settling, "without material hindrance," to the bottom of the provision chamber, and thus cooling, with the greatest uniformity, the entire space of the latter.

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So with regard to the ascending passages through which the warm air is to rise from the provision to the ice chamber. These passages under the Hambrook patent must be at the opposite side of the refrigerator, while the passage through the horizontal partition for the descent of cold air from the ice to the provision chamber, must be at the middle, in order to secure the greatest activity of circulation and the ascent of the warmer air "without meeting the descending current of cold air." The sides of the refrigerator are necessarily warmer than its middle and the greater warmth of the

sides therefore facilitates the upward movement of air at these points, while they do not affect the free descent of cold air in the central part of the provision chamber. The termination of these ascending passages at the top and sides of the ice-chamber and their being overhung by guards, which prevent the *the* falling of ice thereinto, as shown and described in the Hambrook patent are also features having reference one to the free circulation and the other to the prevention of moisture in the provision chamber which would result from the melting of ice in the latter.

While certain of the prior patent exhibits present some one or perhaps more of the individual features, which have been just pointed out or might be enumerated as entering into the construction described and claimed by Hambrook, no one of said patent exhibits presents the combination and arrangement which makes up the Hambrook construction as an entirety, whether using or not the particular form of individual elements which Hambrook shows and describes.

Taking up these patents, I have divided them into two
229 groups, in one of which each refrigerator described shows a communication with the outer air, such as to more or less completely prevent the passage of warm air from the provision chamber to the ice-chamber, and on the other hand, providing for the discharge of such warm — outside of the provision chamber while taking outside air into the ice-chamber. The other group of exhibits illustrate refrigerators having no communication with the outer air (except incidentally when the doors are open), and in which the same body of air is constantly circulated through the ice and provision chamber. It is to the latter class that the Hambrook refrigerator exclusively belongs.

In the first of these groups are included the following patents: The Yost of 1859; the Harris of 1867; the Banta of 1867; the Koch of 1868; the Rohrer of 1871; the Little of 1872, and the Page of 1876.

And thereupon a recess was had until 2 o'clock.

In the Yost patent, the ice itself is not exposed to contact with the air at all. It is enclosed in a chamber placed within a second chamber, somewhat larger than that containing the ice, and this outer chamber receives air only from outside of the refrigerator. Passages lead from this outer chamber to the provision spaces, some of which are at the side and others of which are beneath it. Passages are provided leading from the uppermost provision chambers to the outer air, but there is no opening whatever by which the air may pass from the provision chamber into the space containing the ice-box. Even assuming that a sheet-metal ice-box answers to a body of ice, there is therefore a radical difference of construction and mode of operation between the Yost refrigerator and
230 that of the Hambrook patent. The Yost patent, however, contains an individual feature which is broadly like a feature in the Hambrook patent, namely, openings in the bottom of the chamber containing the ice-box over which openings are placed deflect-

ing plates. It is not urged, I believe, that this patent, or any other of this group, anticipates the Hambrook invention. In fact, I understand from the deposition of defendant's expert, that no one of the entire list of defendant's exhibits presents the construction of said Hambrook patent as an entirety.

The Harris patent has an ice-box above the bottom of which is placed an ice-rack or grating *h*, corresponding with that shown in the Hambrook patent. This ice-box has a hole through the bottom over which no deflecting plate is placed, but beneath which a trough is situated. It also has openings through one end, through which air may escape from said ice-box in a horizontal direction into the upper part of the provision chamber. No air can enter the ice-box except from the outside of the refrigerator, through the openings *x*, *v*. The warm air escapes directly out of the refrigerator through the opening *y*. There is nothing in this patent corresponding with the uptake flue *c*, *c* of the Hambrook patent, and of course there is no circulation or mode of operation as that which inevitably takes place in the Hambrook refrigerator. Said Harris patent therefore fails to anticipate the Hambrook invention.

The Banta patent has an ice-box, the walls of which are of slate, the use of this material for such ice-box being one of the principal improvements claimed in the patent. This ice-box is closed at the top and sides, and has an opening only at the bottom, over which is placed an ice-rack or support. There are passages around the ice-box, but none leading into it by which the warmed air
231 ascending from the provision chamber may come in contact with the ice. On the other hand, any warmed air which shall ascend through either of these passages finds its escape into the outer air through an opening 14, figures 1 and 2. Any descending air, whether from the outside or from the provision chamber (having been first carried up to the top of the side of the ice-chamber) descends externally to said ice-chamber and merely passes beneath it. A wide inclined shelf *i* extends nearly across the refrigerator beneath the open bottom of the ice-box and catches the drip, delivering it into a trough *k*, whence it descends to near the bottom of the refrigerator, where it is delivered upon an inclined board and upon a keg *n*, manifestly filling the whole provision chamber of the refrigerator with moisture.

The narrow inclined shelf *i*, which has been referred to by defendant's expert as a device for preventing the drip from entering the provision chamber, does nothing of the kind. It merely delivers that drip upon the subjacent and wider shelf, whence it is delivered directly into the provision chamber.

This Banta patent, therefore, has neither the construction nor the combination of parts and passages by which the characteristic operation of the Hambrook refrigerator is obtained, and it has none of the distinctive purposes of the Hambrook patent, embracing the delivery of cold air in a dry state to the provision chamber and warm air to the ice-chamber. It also lacks the arrangement of a central passage for the downflow of cold air in the coldest part of the refrigerator, coupled with ascending passages for the warm air

at the sides of the refrigerator, by which the currents do not interfere with each other, and an effective circulation is attained.
232 Besides, as stated, it does not deliver the warm air from the provision chamber into the ice-chamber at all. For all these reasons said Banta patent does not contain the invention of the Hambrook patent.

The Koch patent illustrates an ordinary water-cooler of very primitive type, with the addition of a removable provision chamber, which sets down in the water being cooled. The water-cooler lid has holes through its top, through which the arrows would indicate that there is only an outward passage of air, though manifestly, air must enter before it can pass out, or one body of air must enter while another is escaping. The provision chamber, which is placed below the perforated ice-pan, has also a cover with an opening in it, which opening communicates with the general space beneath the perforated ice-pan. Over this opening in the provision chamber and beneath the ice-pan, is a roof or deflecting plate, *k*, which prevents the drip from entering the provision chamber. This deflecting plate is all that I find in the Koch patent in common with the Hambrook. There are none of the other features specified in the Hambrook claim and going to make up the combination of elements and entire structure which forms the subject-matter of said Hambrook claim.

The Rohrer patent is essentially like the Koch, except that the water is not accumulated in the lower part of the chamber and a separate provision chamber provided, but the whole of the lower part of the refrigerator is devoted to the provision space. There is an opening through the top of the refrigerator whence warm air may escape and the air of the surrounding room may enter, if it is so inclined, or the conditions favor this action. The ice-
233 chamber K has a rack, beneath which is a double series of troughs, pitching towards the center, and having spaces between them throughout their entire length, through which cold air may descend over almost the entire area of the refrigerator. These numerous and extending openings do not at all correspond with the single central opening of the Hambrook patent, inasmuch as, extending to the very border of the uptake passages, there must be a conflict of ascending and descending currents which is one of the expressed purposes of the Hambrook construction to prevent, by the arrangement of downflow and upflow passages, which the latter describes.

Over each of the numerous spaces between the inclined troughs of Rohrer patent is placed an inverted trough or deflecting plate, operating to prevent the drip from the superjacent ice from passing down with the cold air. This patent has been thought to be of sufficient significance by the defense to warrant the production of a model as one of their exhibits, illustrating the ice-box and the multi-trough bottom of the ice-chamber. This model clearly illustrates the difference which I have pointed out between the Rohrer ice-chamber and that of the Hambrook patent, respecting the relative position of the downflow and upflow air passages. From said model

it will be observed that each one of the several downflow passages is separated at its outer end only by the thickness of the side of the ice-chamber, from the external upflow passage for the warmed air, and that in said Rohrer device there is no central downflow passage for cold air at all. The space where this single central downflow passage in present in the Hambrook refrigerator is in the Rohrer device, occupied by a trough.

234 Owing to this essential difference in the combination and arrangement of these air passages, there must be of necessity, a defective circulation in a device constructed under the Rohrer patent as compared with that of a Hambrook refrigerator. It is of no account that the Rohrer device shows openings covered by deflecting plates inasmuch as this is not the subject of the Hambrook patent, which is for a combination of numerous features (including a differently located opening so covered), of which a covered opening is but one.

I therefore find that the Rohrer patent does not contain the combination of elements or features which form the subject of the Hambrook claim.

The Little patent has an ice-box having no communication whatever with the provision chamber except through the bottom of the ice-box and it can, therefore, by no possibility, have the mode of operation belonging to the Hambrook refrigerator, which provides for the induction of warmed air at the top of the side of the ice-box, and the eduction of cold air through the middle of the bottom of the ice-box to the provision chamber. In other words, there can be no such circulation of air from one chamber to the other in the Little patent as in the Hambrook. On the other hand, in the Little device there are holes, *e*, *e* leading from the top of the provision chamber to the outer air. which are described in the patent as "ventilator apertures for the purpose of allowing the heated or warmed air to escape."

This patent shows only a grate over the central opening of the ice-chamber, not at all adapted or intended to prevent the downflow of water, and beneath this opening is a trough, which, besides catching the water, is admirably calculated to impede the downflow of cold air to the bottom of the refrigerator and to deflect it directly towards the ventilator opening, through which — is to escape.

235 This Little patent, therefore has none of the distinctive features of the Hambrook invention, as set forth in the patent and specified in the claim thereof.

The Page patent illustrates a refrigerator having an ice-box of metal, which is intended to prevent contract with air of the ice itself. This ice-box rests on ribs of a pan having two openings through its bottom, one in the middle for the descent of the cold air and another near one end for the descent of the water formed in the ice-box, the latter having a spout directly over this second opening so that the water formed by the melting of the ice, may be delivered directly into an open pail located in the provision chamber. There are inlet passages *g*, *g* by which external air is supposed to enter the refrigerator and to be directed against the sides of the

metal ice-box, and there are uptake flues, h, h^1 on all sides of the refrigerator leading from about the middle, (vertically) of the provision chamber to points near the top of the ice-box and external thereto.

From the application of the arrows in figure 2, the impression is sought to be given that the outer air is all the while entering this refrigerator at all of the openings connecting the interior with the exterior thereof. Obviously, this is absurd. It is manifest that the circulation of the outer air through the refrigerator will be inward at the lowermost of the openings, g, and outward at the uppermost or more elevated of said openings, g, and it is apparent that if outer air enters at the lower of said openings, a corresponding amount of air from the provision chamber will pass directly from the upper end of the flues, h, h^1, to the highermost of the openings, g—the arrows to the contrary notwithstanding.

236 It is to be noted that the central opening in the pan beneath the ice-box is covered by a deflecting plate, which will prevent the water condensed on the ice-box from dripping through said opening into the provision chamber, and that in this single feature, the Page device is somewhat similar to the Hambrook. For the purposes of the Page invention, however, it would have been just as well to put a trough under this opening to convey the dripping to the uncovered water pail located in the provision chamber, since it was no part of Page's purpose as it was of Hambrook, to keep the provision chamber dry. The open pail of the Page device defeats that end entirely and the water might as well fall through the central opening of Page's pan as through the other opening through which he spouts the entire melted product from the ice-box on its way to the pail.

The location of the lower end of the Page uptake flue so far down the sides of the provision chamber, also leaves no means for carrying off the warmest air which will form in the upper portion of said chamber. Even such circulation as the Page patent contemplates therefore will be defective and only partial and wholly unlike that of the Hambrook patent, in which the uptake flues lead from the very top of the provision chamber and enter by the most direct route to the top and interior of the ice-box.

This Page patent has also been thought worthy of illustration by a model, but said model only presents the ice-pan with its central opening and the deflecting plate covering it. As this by itself is not the subject of Hambrook's claim, said partial model has no bearing in the way of anticipation of said claim, which as already stated, is for a combination of several features others of which are not pretended, I believe, to be found in the Page patent.

237 This Page patent, however, shows that in refrigerators as well as in roofing generally, an upturned flange at the edge of a roof is the full equivalent of a trough hung beneath the edge, and it therefore shows in my judgment, that complainant in employing in the refrigerator he now makes, such upturned flange instead of a downturned and trough-shaped extension of the pan at the edge of the air opening, has not departed from the invention of

the Hambrook patent, but has only adopted another and equivalent form of the same device shown in the patent.

It is to be further noted that in the Page patent the central opening in the drip-pan runs lengthwise of the refrigerator, and not across it from front to rear, as in the Hambrook patent, and it is also to be noted that such central opening in the drip-pan is not combined with uptake flue at the sides of the refrigerator, which are of the full width of the latter, as in the Hambrook patent, but with narrow pipes located at different parts of all sides of the refrigerator. As I pointed out in my *prima facie* deposition, the Hambrook construction employing uptake flues of the full width of the refrigerator, at both sides thereof, and a downflow passage midway between them, and of substantially the full width of the refrigerator, is calculated to give freer and equal circulation throughout the entire provision chamber. This result is manifestly not attained by the different construction pointed out in the Page patent.

In view of the differences above pointed out, I am of the opinion that the Page patent does not contain the invention claimed by Hambrook.

The second group of defendant's exhibits includes the following patents:

238 The Sanford patent of 1855 and its reissue of 1857; the Lyman patent of 1857; the Law patent of 1867; the Chase patent of 1869; the Hunt reissued patent of 1872, original 1870; the Butler of 1875, and the Smith patent of 1877 together with its reissue of 1878.

In this class of refrigerators there is no communication with the outer air, except when the door of the ice-chamber or provision chamber is open.

The Sanford patent and reissue shows a refrigerator having an ice-box with a funnel-shaped perforated bottom, which bottom forms essentially an ice-rack for the direct support of the ice. The perforations extend over nearly the entire area of the bottom, and each hole in said bottom is sought to be covered to prevent water dripping through it, by a horizontal projection formed of part of the bottom itself in punching the hole. There is no partition, horizontal or otherwise, beneath this ice-rack, and there is nothing to prevent the accumulation of condensed vapor on the under surface thereof. There being no horizontal partition beneath the ice-box, and consequently no central opening in such a partition, there is no deflecting plate to prevent the dripping of water from or through the rack, through the opening of a partition. There is a central hole in this funnel-shaped bottom of the ice-chest for the discharge of water, and beneath said central hole is placed the wide mouth of a spout to catch the drip. The air is expected apparently to pass downward through each and all of the perforations in the bottom of the ice-box, notwithstanding the ice rests directly thereon, and, as it melts, will shut up as many holes as it covers. Before the block of ice resting in this ice-chest shall have thus melted away, it

239 may be understood as resting on the ends of projections which cover the holes, so that air can pass beneath the block of ice

and downward to said holes. In that case, the downflow of air will be through numerous passages distributed over the entire bottom of the ice-chest, and will give a downward current of practically the full lateral dimensions of the ice-chest, as indicated by the arrows in the drawing of the original patent.

The inventor, Sanford, makes the subjacent provision chambers of practically the same lateral dimensions as the ice-chest, so that there is a downward current of air throughout the whole width of said provision chamber. At one side of this set of provision chambers he provides an uptake flue leading from the very bottom of the provision chamber to the top of the refrigerator, where it delivers into one side of the ice-chamber. This uptake flue is shown in the original patent and in some of the figures of the reissue as being made wide enough for use as a provision chamber, while in one figure of the reissue he shows it narrower and only sufficiently wide for the upward passage of air. In contrast with this construction, (which is worthless and impracticable because the ice will stop the holes in the bottom of the ice-chest which it covers, and will stop them all if big enough), the Hambrook patent shows an ice rack or support, a subjacent partition, a central passage in said partition in the coldest part of the refrigerator, a deflecting plate over said central passage, and uptake air flues at the sides of the refrigerator and in the warmest part of the latter, all calculated to favor a rapid circulation and to keep the provision chamber dry, and all that is in it fit for use. Plainly, in my opinion, the Sanford patent has no bearing whatever as an anticipation of this practical and successful device.

240 The Lyman patent does not contemplate a portable refrigerator at all, but describes an apparatus to be placed in rooms or apartments. The title of the patent is "Improved method of cooling and ventilating rooms, etc." In the first paragraph of the patent the inventor says, that he has invented certain new and useful improvements in "cooling, drying, and disinfecting rooms." He then goes on to say that his invention consists in the peculiar construction of the box or reservoir for holding the ice or other cooling material. In the course of his specification he refers to the "cooling of living rooms, dairies, etc.," and he proposes a modification by which a living stream of water may be passed through the cooling box instead of using ice. He also speaks of putting more than one or several of his apparatus into an apartment when it is of considerable size. Finally he claims, "in cooling, drying and disinfecting rooms, the combination of a descending conduit or cold-air flue with a reservoir for containing cooling materials."

And thereupon an adjournment was had until Thursday morning, February 6, 1890, at 10 o'clock in the forenoon.

P. H. D. MASON,
Notary Public.

CHICAGO, ILL., *February* 6, 1890.

Met pursuant to adjournment.
Present: As before.

The direct examination of M. E. DAYTON is thereupon resumed.

Answer to Q. 3 continued:

This apparatus in one of its forms is shown detached in figure 2, and in another of its forms within the inclosure of figure 1, which inclosure represents the walls of a room or compartment, made relatively small in the drawing in comparison with the apparatus with a view to economy of space on the sheet.

241 The distinctive feature of the Lyman improvement is the addition of a downflow pipe F, leading from the bottom of an ice-chamber to the floor of the room. The object of this improvement, as stated in the patent, is to produce what the patentee calls a blast of cold air, into the very bottom of the room containing this apparatus by confining it in the relatively narrow pipe F until it reaches the floor, and then for the first time allowing it to spread out over the floor and by its accumulation there to displace the warm air above it.

The warm air thus displaced and lifted rises to the top of the room and finds entrance to the ice-box again over the side thereof. Even in the drawing figure 1, where the room is shown disproportionately small, and the cooling apparatus disproportionately large, the space at the side of the ice-box in the upper part of the room is about half the width of the ice-box itself. In any such room or apartment, as the patent refers to, this space in the upper part of the room would be many times the width of the ice-box.

While it may be urged that this cooling apparatus of Lyman might be applied to a portable refrigerator, the Lyman patent furnishes no indication of what would be the construction of details in that case; further than that it may be supposed the ice-box would be off at one side and the down flue at one side. This would not give the construction of the Hambrook patent with the down flue at the middle of the refrigerator, not confined by a flue reaching to the bottom thereof, but delivering cold air directly into the upper part of the provision chamber where, in direct contrast with the Lyman construction, the cold air is allowed to at once spread out as it descends so as to cool the upper as well as the lower part

242 of the provision chamber, and yet find unobstructed descent to the bottom of said provision chamber, by reason of the remoteness of the uptake flue for warm air, which are constricted and are located at the extreme side of the refrigerator. Nor would it be the Hambrook construction with respect to the details of either uptake flue *c* of the Hambrook patent, which has an especial reference to the top lid of his portable refrigerator in the employment of the guard *e*, which overhangs said passage *c* to prevent the admission of ice into the provision chamber. So far as indicated in the Lyman patent, the ice is to be carried into the room A and lifted over the side of the ice-box. Hambrook, however, makes an invention in portable refrigerators exclusively, and his construction involves the

occupation of almost the entire upper part of the refrigerator by an ice-chamber, a top lid for the introduction of the ice and side flues for the ascending warm air which are adapted to these features of construction, and to the attainment of his general purpose of keeping the provision chamber dry by the application of the overhanging guards *e e*, which prevent the admission to and consequent melting of ice in the provision chamber. The Hambrook constructian, moreover, has the special object in view of admitting the cold air directly to the top of the ice-chamber, and yet to provide for an active circulation by making the opening in his horizontal partition at the middle thereof, which is the coldest part of the refrigerator, and his uptake flues at the sides, which are the warmest parts of the refrigerator. In the Lyman patent one side of the room A is as warm as the other, because both sides are equally exposed ordinarily to external air of the same temperature.

I know it has been urged that to back up one Lyman
243 refrigerating-room against another—that is to say, to build a double house with a refrigerating apartment in each, one on one side and the other on the other of the same division wall—would give the Hambrook refrigerator, in that modified form of the latter described in the Hambrook patent, where it says that a central partition may be extended upward from the bottom of the provision chamber to the top of the ice-chamber. I dissent from this view. Each Lyman refrigerating-room would, in that case, be separate and distinct from the other, and separately as complete and independent as though they were in different buildings a mile apart. In the Hambrook construction, whether the partition be present or not, the middle of the refrigerator would always, in operation, be the coldest part thereof, and the circulation would be, in part, dependent on this fact. The Hambrook refrigerator, with or without the central partition, is equally a unitary thing; the juxtaposition of two refrigerating-rooms containing the Lyman apparatus, would not constitute such a unitary thing. Besides, the prior art here shown, does not show that two Lyman refrigerating-rooms were ever put together in the manner proposed, either with the purpose of effecting a general result involving both, or even by mere accident.

Regarding the Lyman refrigerating-room and apparatus as an entirety in the form exhibited in his patent, and noting the differences which I have hereinbefore pointed out respecting the point at which cold air is delivered into the provision chamber—at the top and middle of said chamber in the Hambrook patent, and at the side and bottom thereof in the Lyman patent—and the absence from the Lyman construction of the features which char-
244 acterize the uptake flue in the Hambrook patent, I am clearly of the opinion that said Lyman patent does not contain or suggest the invention set forth and claimed in the Hambrook patent. I am also of the opinion that the placing of two of the Lyman refrigerating-rooms back to back, would not contain the Hambrook invention when used with the central partition as may be done under the patent, because neither compartment would then be like in construction or operation to the corresponding compart-

ment of the Hambrook patent, and, for reasons stated, the two adjacent refrigerating-rooms would not constitute a unitary refrigerator having the mode of circulation and the relation of down and up currents to the exposed wall of the refrigerator that is contemplated and is present in the Hambrook refrigerator.

The Law patent illustrates a portable refrigerator having an ice-box extending nearly across its width, with uptake air flues at the sides, overhung by portions of the top, a bottom to the ice-box consisting of two inclined parts, H H, separated from each other by a central opening extending from front to rear of the refrigerator, two corrugated ice-racks resting on these inclined bottom pieces, and a central trough placed beneath the central opening between the bottom pieces, H H.

Several of these features are like those of the Hambrook patent. There are, however, several important differences which materially affect the operation of the apparatus, and which prevent the objects aimed at and attained by the Hambrook construction. First, I point out that the ice rack or support drips directly on the inclined bottom board and being in two parts, C C, does not extend across the opening between said bottom pieces. Moreover, said ice-racks rest directly upon the inclined bottom pieces, H H, and there is
245 no room for the introduction of a deflecting plate between the rack and said bottom pieces H H. Correspondingly, there is no such deflecting plate, but the drip from the ice, if not the ice itself, or a portion of the latter, falls or may fall directly through the central opening E, into the subjacent trough F. As a result of this construction in the Law patent, the trough F is practically one part of the bottom of the ice-chamber, and a condensation of the lower surface of said trough, may and will drip directly into the provision chamber beneath it.

Next I point out that the lower edges of the bottom pieces, H H, are bent downward within the trough, F, and the sides of said trough are carried upwardly outside these downwardly bent margins of the central opening, E. It is between these margins of the central opening, E, and the sides of the trough, F, that the cold air from the ice-chamber must pass into the provision chamber. It needs but a glance at the drawing, figure 1 of the Law patent, to see that these parts are directly calculated to prevent a free downward settling of the cold air at the middle of the refrigerator, but are calculated, on the other hand, to deflect the cold air upwardly and sidewise beneath the bottom pieces, H H, and toward the side openings, B B. As a result there must be a short circulation, limited to the upper part of the provision chamber in the Law patent. Neither of the objects set forth in the Hambrook patent of excluding moisture from the provision chamber and of causing a free and active circulation throughout the entire provision chamber can, therefore, be obtained by the Law construction.

While the Law patent presents some of the features of the Hambrook patent, it does not present all of them and it therefore
246 does not contain the combination specified in the Hambrook claim, and inasmuch as the differences involve differences in

mode of operation, in effectiveness and in results and inasmuch as the parts omitted by Law from the Hambrook construction are not supplied by equivalents or (reversing the statement) inasmuch as Hambrook has not in his changes from the Law construction employed equivalents of the Law devices, it is my opinion that said Law patent does not anticipate the invention set forth in Hambrook's claim.

The Chase patent shows a refrigerator having an ice-chamber separated from a subjacent provision chamber by a bottom board, *b*, having a downflow opening, *h*, at one edge thereof and adjacent to one side of the refrigerator and having its upper surface inclined toward said opening, where it is provided with a trough. It also shows an ice-rack in the ice-chamber above the bottom board, *b*, and it further shows an uptake flue, *e e*, leading from the provision chamber at the side thereof opposite the downflow passage *h* and extending with four deflections or elbows, to the very top of the cover of the ice-box, downwardly through which it opens into the ice-chamber. There are in fact, two of these uptake passages *e*, each in the form of a tube, as illustrated in figure 1. There are probably a plurality of the downflow passages, *h*, each in the form of a round hole. I should judge from the drawings and from the statement in the patent near the bottom of the first column, where it says that "the floor B is provided" * * * "with apertures *h* for the descent of the cold air."

Besides the ice in this Chase patent rests on a rack, *b*, the back of the ice-chamber is also a rack, composed of vertical bars, as shown in figure 1. There is no deflecting plate over the opening *h* through
247 which the air descends from the ice to the provision chamber and nothing to prevent the dripping from the back part of the ice-chamber directly through said aperture into the provision chamber. Besides this difference between the Chase and Hambrook construction, which is vital to the accomplishment of Hambrook's purpose, it will be observed that the Chase refrigerator does not have the openings for the descent of cold air in the middle and coldest part of the refrigerator and passages for the ascent of warm air at opposite sides of the refrigerator. Neither does the Chase device deliver the warm air through short and the straightest possible passages to the upper part of the ice-chamber, and for both these reasons, the Chase device cannot have that free and active circulation, which is characteristic of the Hambrook construction. The Chase device is therefore not calculated to accomplish either of the two principal objects set forth by Hambrook, to wit: the delivery of cold air in a dry state to the provision chamber and an active or unimpeded circulation of air from one chamber to the other. For these reasons as well as by differences in details of construction, so obvious as not to require specific mention, the Chase patent in my judgment does not present the invention of the Hambrook patent.

And thereupon a recess was had until 2 o'clock.

The Hunt patent illustrates a refrigerator in which the shelves are mounted on a central, vertical axis so as to rotate and thus

bring the article thereon into convenient reach through the door at one side. In keeping with this feature the refrigerator is circular in form, though, of course, it may be square, with a waste of space at each corner. Into this circular refrigerator sets a conical ice-box having its lower end the smaller. This gives an annular up-
248 wardly contracting space on all sides of the ice-box. The bottom of this ice-box is provided with several radial openings: C, bordered by upturned flanges which prevent the water from passing through them as it runs along the bottom towards the depressed middle point thereof in seeking escape through the central discharge tube O. Over each of these radial holes is placed a cover open at its outer end so that air may pass beneath said covering and downward through the passage C beneath it, while it prevents the falling of water from the superposed body of ice, that is sustained on a perforated rack or support P. Through the sides of the ice-box near the top thereof, are a series of holes *i*, through which warm air ascending from the provision chamber may enter the ice-box.

In this refrigerator there will be a downward movement of cold air through the opening C into the provision chamber and an upward movement of air from the provision chamber into the ice-chamber through the holes *i i*. If Hambrook's claim were broadly for an ice-chamber, a subjacent provision chamber, holes in the bottom of the ice-chamber for the descent of cold air from the ice to the provision chamber and holes in the upper part of the ice-chamber communicating with the provision chamber so that a circulation of air will be produced by the action of the ice thereon, then this Hunt patent, like a half dozen or more patents already considered, would anticipate it. But such is not the case. The Hambrook patent, as repeatedly pointed out, is for a combination and arrangement of features by which certain objects are attained, a primary one of which is an active circulation of air in which the down currents conflict as little as possible with the up currents. While the Hambrook patent is further restricted to certain structural characteristics, it is enough
249 to say of this Hunt patent that it has no correspondence, in my judgment, with the Hambrook in those general features which contribute to that one of its principal objects which I have just mentioned. With reference to that object, the Hambrook patent shows and claims as one of several features in combination, a bottom to the ice-chamber, which has a single long opening from front to rear in its middle through which the cold air descends in the central and coldest part of the provision chamber, and as other of such features, two parallel and similarly extensive uptake passages at the opposite sides of the refrigerator. There is therefore, as already pointed out, a considerable distance between the point of descent and each of the two points of ascent for the air. In this Hunt patent, no such purpose and no such construction for its attainment are found. The radial air passages in the bottom of the ice-box give a down current of air practically as wide as the ice-box itself, and immediately in contiguity with the annual up current at the extreme outside of the provision chamber. It is obvious therefore, that the ascending and less frigid air is not free to move towards

the ice-box, "without meeting the descending currents of cold air," as specified in the Hambrook patent.

For this reason and for the additional reason that the uptake passages in the Hunt patent are structurally unlike those of the Hambrook in their location, extent and condition of being covered at their upper ends by guards for the prevention of the entrance of ice, necessary to the objects had in view by the Hambrook patent, and in the construction and arrangement of said passages, I fail to find in the Hunt patent, any anticipation or suggestion of the construction specified in the claim sued on.

250 The Butler patent shows a refrigerator in which an ice-box occupies an upper corner of the refrigerator; is open at one side at the top to admit war- air; is provided with two bottom pieces *e e* having a central space between them; has an ice-rack above said bottom pieces and a trough below the opening between them, and in which a shallow water-cooler of circular form is sustained on brackets between the ice-rack and the bottom of the ice-chamber. This refrigerator of the Butler patent does not have a top lid, but a front door for the insertion of the ice. It has nothing corresponding with the two passages *c c*, one at each side of the ice-box, and covered by the guards *e e*, either in themselves or in combination with a central opening in the bottom of the ice-box, midway between said uptake passages *e*. The Butler device also has no deflecting plate over the central opening in the bottom of the ice-chamber to prevent water passing through said opening, but on the other hand all of the water that is formed by the melting of the ice, is and must pass through said opening, and into the subjacent trough, whence it passes out through the pipe *f*.

I know it has been urged that the water-cooler *c* acts as a deflecting plate. This is not true in the sense of the Hambrook patent. In the latter troughs at the margins of the central opening, carry off all the water that falls upon the bottom pieces *x y*, and prevents its passage through said opening. The deflecting plate *k* catches all the water that would drip through said opening and delivers it upon the bottom pieces, so that no water at all passes through the opening between said bottom pieces. In the Butler patent, all the water that falls upon the bottom pieces does not pass through the opening and all the water that falls from the cooler, also falls

251 upon the bottom pieces and thence through the openings between them. If the cooler were not present, the water which it intercepts would fall directly into the trough or into the same place it ultimately reaches when the cooler is present. The cooler therefore, takes no part in accomplishing the general object of preventing water from going through the central opening in the bottom of the ice-chest because no such object is had in view, and no such result is attained.

In the arrangement of the ice-chest at one side of the Butler refrigerator, the location of the downflow opening in the middle of the bottom of said ice-chamber cuts no figure towards producing the result aimed at in the Hambrook patent, since it is not combined with two uptake passages located at the sides of the refrigera-

tor, but on the other hand, the Butler refrigerator is one essentially having a downflow of cold air at one side and an upflow of warm air at the other side of the provision chamber. Both sides being equally exposed to the action of the outer air, there is therefore not the same effect upon the several air currents, as in the Hambrook patent, wherein the downflow is central to the provision chamber and there are two upflow passages at opposite sides thereof.

For all these reasons, I do not find in the Butler patent, the construction set forth and claimed in the Hambrook patent.

The Smith patent illustrates and describes a refrigerator which, in my judgment, more nearly corresponds with that of the Hambrook patent in its general features, than any other of all the defendant's exhibits in this case. Yet it lacks two of the characteristic features of the Hambrook construction and elements of the Hambrook claim. It has an ice-box extending nearly across the
252 entire width of the refrigerator, leaving an uptake flue or passage at each end of the ice-box; it has a central opening in the bottom of the ice-box extending practically from front to rear of the refrigerator and midway between the lateral uptake flues; it has an ice-rack supported above the bottom of the ice-chamber and it has upturned flanges answering to troughs, surrounding the central opening of the bottom of the ice-chamber. It lacks entirely a deflecting plate or any equivalent thereof, over the central opening in the bottom of the ice-chamber and its uptake flues do not discharge into the sides of the ice-chamber at the top thereof, and are not provided with overhanging guards at such terminal opening into the ice-chamber for the prevention of the admission of ice through them into the provision chamber. On the other hand, when the top lid is open for the admission of ice to the ice-chamber, the upper ends of the uptake passages are entirely uncovered, so that fragments of ice may easily fall thereinto. When the lid is closed, these uptake flues, instead of communicating directly and laterally with the upper part of the ice-chamber, are continued through spaces in the cover itself, which meet and open into the ice-chamber at the middle of the lid. A result of this prolongation of the warm-air flues, into and through the lid of the ice-chamber, is the production of a proportionately greater amount of friction, and a corresponding retardation of the air currents, which result is increased by the addition of one or more elbows or bends in each of said uptake passages before the air reaches the ice-chamber. Such retardation of the movement of the warmer air of course proportionately affects the entire circulation of the refrigerator, because the cold air can descend no faster than the warm air passes to the ice-box.

253 The absence of a deflector over the central opening in the bottom of the ice-chamber, of course allows any drip from the superposed ice-rack to fall through said opening into the provision chamber and, as a consequence, the air does not descend in a dry state and a principal object of the Hambrook patent, which consists in obtaining the utmost dryness of the provision chamber, is not attained.

I am aware that it is urged that the absence of perforations in the central portion of the ice-rack or support I, of the Smith patent, constitutes itself a deflective plate. It is plain that water will not drip in streams directly from the block of ice through this imperforate portion of the ice-rest or rack, but, on the other hand, it is plain, that water will fall through the opening *e e*[1] and over the front and rear edges of this imperforate central portion of the ice-rest and that it will adhere in drops to the under surface thereof and will in this form, be carried along by the air current towards the central opening in the subjacent bottom, where meeting each other, or being no further impelled by the air currents, they will drop through said opening into the provision chamber. An imperforate ice-rest is an entirely different thing from a separate deflector interposed between such ice-rest and a subjacent opening. By the insertion or addition of such a separate deflector, the drippings to which I have referred would be caught and carried to opposite sides of the opening and dropped on the bottom itself and not through the opening therein.

While the Smith patent therefore, contains some of the general features of the Hambrook refrigerator as described and claimed in this patent, it fails by reason of the differences above pointed out, to contain the invention specified by Hambrook in his patent and claim.

254 Lest it may seem that I may have attached undue importance to many of the differences that I have pointed out between the Hambrook refrigerator and the devices of several of defendant's exhibits, I wish to say that the forces operating in a refrigerator to produce a circulation are exceedingly weak, and that very slight modifications in construction may prove and do prove in practice of vital importance, with respect to the practical efficiency of the apparatus. In my judgment, the differences between the Hambrook construction and that of either of defendant's exhibits, in so far as they relate to the freedom and ease of circulation, give to the Hambrook refrigerator a marked superiority in this respect.

In regard also to the feature of dryness of the provision chamber, it is of the utmost importance, that there be if possible, a perfect exclusion of water from said chamber, since the evaporation of only a small quantity, such as may easily drip from the bottom of the ice-rack of the Smith patent, or may be melted from fragments of ice admitted through the warm-air flues of said Smith patent, will act most harmfully upon many articles which it may be desired to preserve in the refrigerator.

Hambrook, in his construction, has had a careful reference to these vital points of success, in the contrivance and arrangement of all the parts entering into his construction, and if, in fact, he has not produced any one new element which enters into his claim, he has made such a combination and arrangement of old elements as has undoubtedly produced a refrigerator superior in its entirety to any shown or described in defendant's exhibit. In doing this, he has, in my judgment, made an invention which he has, with suffi-

cient clearness and accuracy, specified in his patent and his claim.

255 It has been urged by defendant's expert that because each of Hambrook's separate elements, considered by itself, is old, they therefore do not form a combination, but amount to a mere aggregation. This is simply absurd. Suppose they were all separately new with Hambrook? There would then be no doubt of their combination. Would they form any less combination after the expiry of the Hambrook patent, when, to the followers in the art, they would be old and public property? Certainly not. In my understanding, the question of "combination" is a question of co-operation of the elements as forming an entirety. Such co-operation is a question of mechanics or mechanical fact, and is not a question of antiquity or novelty.

Q. 4. Have you read the deposition of defendant's expert, J. W. See?

A. I have, and have made some references in my foregoing answer to positions taken by Mr. See in the understanding (mistaken as it now appears) that the last question was embraced in the preceding one.

Q. 5. Do you find anything in either of the prior alleged anticipating patents, introduced by the defendant, or in the deposition of defendant's expert, Mr. See, which would lead you to alter or modify any opinion expressed by you in your *prima facie* deposition in this case, to wit: that Complainant's Exhibits Defendant's Refrigerators, Nos. 1 and 2, embody the construction described and claimed in the Hambrook patent?

A. I do not. Nearly all of the defendant's exhibit patents, concerning which Mr. See testified, were familiar to me before making my said *prima facie* deposition, and he brought out no facts concerning said exhibits with which I was not acquainted, and

256 in his disquisition upon the principles of refrigeration and the movement of air currents, he adduced nothing with which I was not familiar, or with which the ordinary school boy is not acquainted.

Cross-examination by counsel for defendant:

C. Q. 1. In your direct testimony, you stated in your opinion, that the Sanford patent was worthless. Do you think that the Sanford patent would be wholly inoperative and productive of no good results whatever? In referring to the Sanford patent, I refer to the patent as shown and described both in the original and reissue letters patent.

A. I think that preserving the construction of the ice-box shown in said patent, the melting of a block of ice sufficiently that it may rest on the main bottom and not be supported by the projections on said bottom, would cut off the passages beneath the block of ice and thus render them useless, for the purpose of circulation as described in the patent. To this extent and in this manner, the construction shown in the Sanford patent, will defeat its own object. If the

block of ice laterally fills the space between the side projections of the ice-box, it will cut off the entire series or openings in the bottom, and leave only the side passages external to the ice-box for the cooling and downflow of air. These, I think, are manifest facts, and in my judgment in such a case, the apparatus would become practically inoperative.

C. Q. 2. If a piece of ice entirely filled the ice-box of any refrigerator, so that no air could pass between it and the sides of the ice-box, it would render the refrigerator inoperative, would it not?

257 A. That is not the supposition I made in this case. There are lateral projections on the sides of the ice-box of the Sanford patent, and I suppose a block of ice extending only to these projections which would leave ample passage for air about the ice between the projections. In that case, I say, the ice-block would cut off all of the passage through the bottom, and notwithstanding the space around the block of ice, the apparatus would become so far impaired, as in my judgment, to be practically inoperative.

C. Q. 3. Is not the ice-box, as shown by the Sanford patent, practically an open work box, having numerous perforations, both in the sides and in the bottom, thereby giving a much freer passage through the ice-box for the descending current of cold air, than is found in the ice-box of either the complainant's or defendant's refrigerators as now constructed?

A. The perforations in the Sanford ice-box are more numerous and are distributed more widely over the bottom, so that the descending air currents will be correspondingly numerous and widely distributed with respect to the subjacent provision chamber, but the circulation will not therefore be necessarily more free. Subdivision of currents is not favorable to their free motion. A single space equal in area to numerous small spaces will give passage to a greater quantity of air or water under a given impulse. Supposing all of the numerous small passages of the Sanford ice-box to be open or unobstructed, it would then be a question of relative area of said opening as compared with the central opening in the bottom of complainant's or defendant's refrigerator, in determining which permitted the freest movement of the air, it being necessary that the aggregate area of the Sanford opening be considerably greater

258 than the area of the single opening in complainant's or defendant's refrigerator.

C. Q. 4. Does not the Lyman patent of 1856 show a construction which gives free and unobstructed passage to the air from the ice-chamber?

A. To the extent of the size of the conduit F, this is true. Said conduit is said by the Lyman patent to be a trunk or pipe, presumably as wide one way as another and no wider relatively than is shown in the drawing. Such a contracted passage would not be favorable to the freest movement of the air or so favorable as one extending the full width of the ice-box.

C. Q. 5. If the Lyman patent of March 20, 1856, had antedated the Sanford patent of November 13, 1855, would said Lyman invention have been an anticipation of the Sanford invention?

A. I don't think it would, as the Sanford invention is claimed. The Sanford patent claims an open-bottomed ice-box with a dividing partition (which I understand to be a partition dividing the refrigerator) open above and below, (which I understand to mean above and below the ice-box as shown in the Sanford patent), so placed (in the refrigerator) that by means of self-operating internal circulation, the whole of the air that is contained therein (contained in the refrigerator on both sides of the partition) shall be kept in motion and caused to revolve around this partition in currents moving downward only on one side of this partition, and upward only on the other side, when the same is combined with a chamber for the refrigerator of food or provisions placed directly under said ice-box, as set forth.

While under this broad claim, it might be urged that the
259 front and bottom of the ice-box and the front wall of the pipe F of the Lyman patent, constitutes a partition open at top and bottom, there is certainly no chamber for the refrigeration of food placed directly beneath the ice-box in the sense of the Sanford patent, in which said subjacent provision chamber is that in which the down current of cold air takes place. This is an off-hand opinion, formed on only such brief consideration of the patents as I have been able to give them on the spot, and from a first reading of the Sandford claim.

C. Q. 5. Do you think that the Lyman invention is limited to use of the device for cooling and ventilating rooms?

A. I say only this, that Lyman has only shown his adaptation of his device to a room or apartment, and has not shown specifically in what manner he would apply it to a portable refrigerator.

C. Q. 6. Is not the ice-bottom in the Lyman refrigerator of substantially the same shape, so far as is shown in the drawings as one-half of the ice-bottom or one of the so-called inclined bottom pieces of the Hambrook refrigerator?

A. With respect to its inclination alone, it is. It is also like it essentially with respect to the eave-trough. But it is probably not like it with respect to the relative brea-th of the opening leading to the pipe or trunk F. There is no statement in the Lyman patent, except that which I have quoted, bearing on this point, and that would lead one to suppose the pipe F and said opening thereto, to be narrower than the ice-box, while in the Hambrook patent, the opening is substantially of the full width of each of the inclined bottom pieces.

C. Q. 7. If the trunk F is narrower in the Lyman patent
260 than the width of the ice-box, it wouldn't require any invention to extend that trunk to the width of the ice-box would it?

A. No.

C. Q. 8. Does not the Lyman patent show a refrigerating device admirably adapted to prevent the dripping of water into the provision chamber or room?

A. It does not. The ledge, which in figure 1, is over the open pipe F, is hardly wide enough to drip on the inclined bottom piece,

and considering the movement of air on its passage to the pipe F, across the course of the dripping water, which would naturally fall on the very top of the upturned edge or dam, such dripping would be very likely to be carried into said pipe. But the bottom of said ledge is, I think, meant to be shown as horizontal, and if this is the fact, the drippings could easily follow along said under surface and fall into the pipe. In any case, said ledge is not wide enough to effectively exclude water from the pipe.

C. Q. 9. Will you please examine the ledge referred to by you and shown in figure 1 of the Lyman patent and state whether or not said ledge is not inclined downward, and whether the drawings do not show that the water drops upon the inclined bottom pieces of the trunk F?

A. The upper surface of said ledge is certainly inclined. The under surface is not perceptibly inclined, though, perhaps, a nice measurement might show a slight inclination thereof. The dotted lines referred to in the question, pitch so much to the left that they do not represent fairly the course of drippings which would be vertical. However, I will say I presume the inventor may have had in mind the purpose to employ the ledge as a preventive
261 against the dropping of water into the pipe F, and that there would be no invention in making it wide enough to serve that end.

And thereupon an adjournment was had until Friday morning, February 7, 1890, at 10 o'clock in the forenoon.

CHICAGO, ILL., *February* 7, 1890.

Met pursuant to adjournment.
Present, same as before.

And thereupon the cross-examination of M. E. DAYTON was resumed.

C. Q. 10. Do you consider the trunk F an essential feature of the Lyman invention?

A. It is the vital feature of that invention, as set forth in the claim by Lyman?

C. Q. 11. Does the Sanford patent contain this feature which you consider the vital feature of the Lyman invention?

A. It does not, at least in the precise form, and yet, on further reflection, so far as the operation, which is described by Lyman as substantially that of the hydrostatic column, the compartment of Sanford, in which the ice-box is placed, answers to the pipe F of the Lyman alleged invention.

I suppose the former and present questions have reference to what Lyman claims and believes to have been his invention.

C. Q. 12. Is the trunk F limited by the Lyman specification or drawing, to any particular form, size or length?

A. I can't say that the patent necessarily imposes any restriction as to either of these matters. It does not specify the actual or rela-

tive size of the pipe, but the idea of the inventor in this re-
262 spect is clearly indicated by both figures of the drawing. As to the length of the pipe, the patent, in terms, specifies that it may be varied, in accordance with the requirements of the case with respect to the course of the current.

C. Q. 13. Could not the trunk F be expanded so as to be of the same size in horizontal cross-section, as the bottom of the entire ice-box, without departing from the real essential features of the Lyman invention?

A. I don't think that such an enlargement of the trunk would change the operation materially.

C. Q. 14. With such trunk enlarged, as indicated in my last question, is not the Lyman invention adapted for use in the ordinary portable refrigerators?

A. Not to give a practical refrigerator obviously. The mere enlargement of the trunk as proposed, without any other changes and without addition of other parts, would plainly let the entire dripping from the ice-box down into the enlarged trunk, since the widening of the trunk, correspondingly narrows the bottom board of the ice-box and making said trunk the full width of the ice-box, abolishes the bottom of said ice-box altogether.

C. Q. 15. Do you consider the inclined bottom of the ice-box, as shown in the Lyman patent, as a part of the trunk or pipe F?

A. No; but in the Lyman construction the pipe is no wider than the opening in the bottom of the ice-box, and the widening of the pipe in pursuance of Lyman's idea, or with any intelligent purpose, would correspondingly widen said opening.

C. Q. 16. Supposing the trunk F should be severed at a point where the pipe X comes in contact therewith, as shown in figure 1 of the Lyman drawing, and the lower part thereof should be
263 removed, so that the cold air would drop into the open chamber, would that be a departure from the Lyman invention?

A. As I understand this question, it proposes a removal of the pipe F altogether, and such removal would be a total departure from Lyman's invention and a complete defeat of the whole purpose. Lyman doesn't claim to be the inventor of the ice-box, but his invention consists wholly in the attachment of a pipe F thereto, by which he points out that he obtains the effect of a hydrostatic column, or in other words, a more or less tall column of cold air confined in the pipe and having a greater or less gravity force to produce a circulation due and proportioned to its height. The ice-box without any pipe has an effect of the same kind proportioned to its height, but Lyman proposes to increase this effect by the addition of the pipe F. His patent says, "If, however, we should place under the ice a pipe of sufficient size to surround the ice, the air as it is cooled will fall down and soon fill the pipe, but still have a tendency to spread laterally in consequence of its gravity, and therefore it would exert pressure on all sides, similar to a non-elastic fluid. If a plug were now pulled out of the bottom of the pipe, this air would pour out with a certain force, due to the difference of temperature outside and inside and to the height of the column,

obeying precisely the same laws which would govern a non-elastic fluid" (water for example). * * * "At F is the conduit. This is a trunk or pipe attached to the cold-air chamber (ice-box), and may be of different lengths, according as the blast is to be more or less forcible, the higher the column the greater being the weight and velocity of the discharge." His claim is expressly for "the combination of a descending conduit or cold-air flue with a
264 reservoir for containing cooling material." The conduit F is therefore a vital feature of Lyman's construction and claim, and its entire removal, as I understand to be proposed in the question, would consequently be a complete departure from his alleged invention.

C. Q. 17. Does not the Hambrook patent contain the substantial equivalent of the Lyman conduit?

A. It does not.

C. Q. 18. Supposing instead of removing the trunk F entirely, as you suggest in your former answer, you remove all but say two or three inches of the upper part of same, and leave the balance as shown in figure 1 of the Lyman patent, would you then find the Lyman invention?

A. That would be practically a removal of the whole of it, inasmuch as there would be no appreciable effect produced by what would be left of it, and I should say that the emasculated device would not contain the Lyman invention. I understand that the length of the pipe F, though variable under the terms of the Lyman patent, must be such as to produce an appreciable effect, and I should say that its length would be expected to have some relation to the height of the room in which the apparatus is placed.

C. Q. 19. Referring now to figure 1 of the Lyman drawings, is there anything in the specification which limits in any way the space between the left-hand wall of the ice-box and the left-hand wall of the room in which such ice-box is placed?

A. There is not.

C. Q. 20. Such space, then, may be narrowed to a very narrow passage without departing from the Lyman invention, may it not?

265 A. The Lyman invention has nothing to do with the particular width of that space, but is confined exclusively to the attachment of the down flue F to an ice-box. A departure from Lyman's invention must therefore relate to the down flue. I suppose the real question meant to be asked is, would the extension of the ice-box to the neighborhood of the opposite wall of the room, involve invention? If this be meant, the answer would depend upon whether or not any particular result was obtained. If there was, then invention would be implied, and if so it would not be Lyman's invention at any rate, for Lyman neither made nor contemplated any such construction. I don't think that there would be any advantageous result from this change alone, and therefore believe that there would be no invention in making it.

C. Q. 21. Which do you consider the most practical device as ap-

plied to portable refrigerators, the Lyman invention or the Sanford invention?

A. The question, of course, involves the employment of subsequent inventions in adapting the Lyman room-cooling apparatus to a portable refrigerator. Just what alterations for the purpose are had in mind by the counsel, I don't know. And if I did, I don't know that I could give an answer to the question, for the reason that there are a great many things to be considered, and the determination of choice would, of course, best be reached from a comparison of two actual structures. A refrigerator containing the Lyman apparatus would have the down flue F, and the articles being cooled would be subject only to an ascending current of air, all warmer than when it was admitted to the bottom of the provision chamber. In the Sanford refrigerator the articles to
266 be cooled would, in one form of the device, be subject exclusively to downflow of cold air which would grow warmer as it descends, and the other form of the device, some of the provisions would be subject to such a down current and others to an up current. Just what advantage, if any, might result from the use of Lyman's downflow tube F, in comparison with the Sanford construction, I am not able to say. In the foregoing I have ignored the defects in the Sanford ice-box which I have previously pointed out.

C. Q. 22. Does not the Lyman invention contain essentially the same movement of the cold and warm air currents and work upon essentially the same principle as every invention in refrigerators, illustrated in the several exhibits introduced in evidence in this case, which shows the movement of the air confined in the refrigerators?

A. In a broad sense, it does. But the Lyman invention, as an invention, expressly includes the confinement of the cold air within a pipe for some effective distance below the ice-box, with a view of giving greater force to the circulation.

C. Q. 23. I now call your attention to the Yost patent, No. 23803, and ask you whether such patent does not contain deflectors of substantially the same form as the deflector plate *h* of the Hambrook patent?

A. It does.

C. Q. 24. Will you state the object or function of the deflector plate in the Yost patent?

A. To deflect or direct the water which drips from the ice-box into the subjacent troughs, and to prevent such water from dripping through the opening between the troughs.

267 C. Q. 25. Is not the arrangement of the semicircular deflector in the Yost patent so arranged with reference to the troughs, one on either side of said deflector, that the water is carried to the troughs, and the air is allowed to flow through an opening into a provision chamber beneath?

A. It is.

C. Q. 26. Does not the Yost patent show a partition extending upward to the ice-chamber?

A. It does.

C. Q. 27. I call your attention to the Harris patent No. 61734, and ask you if the cold, dry air does not pass from the ice-chamber down into the provision chamber?

A. It does, excepting such drippings as may adhere to the right-hand part of the bottom of the ice-box, and may be carried out through the opening *n*, over the trough *j*, and allowed to fall into the provision chamber.

C. Q. 28. I now call your attention to the Banta patent No. 60665, and ask you if the same does not contain the air circulation common in practical refrigerators, as they are now manufactured?

A. In a broad sense, only, it does. There is a falling of cold air and a rising of warm air, such as takes place not only in every refrigerator, but in every room and space.

C. Q. 29. Is not such cold air also dry air?

A. No. It passes from the bottom of the ice-chamber along with the water which is melted from the ice, into the provision chamber, and such water is not only conducted into the provision chamber, but is openly exposed therein, and finally spread out in a trough and over a subjacent keg, so that in proportion as it absorbs heat, it is vaporized and renders moist the atmosphere in the provision chamber.

268 C. Q. 30. Does not the inclined partition *i* form the bottom, or practically the bottom, of the ice-chamber?

A. It does.

C. Q. 31. Does not the shorter inclined piece *i*, which overlaps the longer piece *i*, make a water shed and allow for the downflow of air, which would be the substantial equivalent of a deflector plate?

A. Not at all; in the sense of the Hambrook patent, or for the purpose of the Hambrook construction, to which I, of course, suppose the question to refer. In the Hambrook patent the purpose is to prevent water from passing through the opening in the bottom of the ice-chamber, and the deflector plate co-operates with the troughs at the edges of said opening, to accomplish this purpose, the final object being to keep the provision chamber dry. In the Banta patent there is no such object; but, on the other hand, all the water from the ice passes through the opening in the bottom of the ice-chamber into the provision chamber. The shorter board, *i*, does not prevent, and is not intended to prevent this, but is merely intended to carry the air which comes down at that side of the refrigerator laterally beneath the ice, so as to be more thoroughly cooled by it and by contact with the cold water dripping therefrom. The water which is caught by this shorter board, *i*, drops on the wider or longer board, and ultimately passes through the opening into the provision chamber, just as it would if there were no shorter board, *i*, present at all.

C. Q. 32. Does not the air, as it passes beneath the lower end of the inclined bottom, *i*, enter the provision chamber in a cold, dry condition?

A. In a cold condition, certainly, but its passage along with
269 the water for such an extent, and its exposure for cooling it, practically only to the water, and not directly to the ice, is not favorable to its utmost dryness, as it enters the provision chamber at the point specified in the question.

C. Q. 33. Does not the Banta patent provide for an internal circulation of air, the colder current falling, and the warmer current rising to take its place, and means for preventing the water from running through into the provision chamber?

A. It has no means for preventing the water from running through into the provision chamber, but it has means for the circulation of air, as described.

C. Q. 34. It has means for preventing the water from passing into the provision chamber through the cold-air inlet, has it not?

A. It has a trough *k* which receives the water after it drops from the edge of the water-inclined bottom piece *i* and a pipe *l* leading from said trough, which conducts the water to a lower point of the refrigerator, but it might, for all practical purposes, just as well omit the trough *k* and the pipe *l* and let the water fall directly down that side of the provision chamber to the inclined boards or water pan *n* upon which it is now finally discharged by the pipe.

C. Q. 35. In the Banta patent, is not the provision chamber situated entirely above the pan *n*?

A. It is, unless the contents of the keg are to be regarded as provisions, and they are no more liquid than milk, which would certainly fall under that head.

C. Q. 36. I call your attention to the patent No. 77624, Koch, and ask you what is the function of the deflecting plate *k* shown in said patent.

A. To prevent water from dripping into the provision chamber E.

270 C. Q. 37. Is it not so arranged as to allow the free passage of air into the provision chamber?

A. It is, in so far as a free passage both in and out of the provision chamber may take place through a single opening.

C. Q. 38. I now call your attention to the Rohrer patent, No. 121,899, and ask you if the Rohrer patent does not show a refrigerator having side passages for the rise of warm air, an ice-chamber adapted to support the ice and to allow the air to reach all sides of the ice, and a series of central air passages for the descent of the cold air.

A. All but the "central." There are a series of air passages extending at right angles from a central line to the refrigerator, an equal number on each side of said central line.

C. Q. 39. Does it not show two air passages which extend from the sides to the center, such two passages together making a central opening with the exception of the narrow separation caused by the trough which receives the water? I call your attention to the drawing R, which shows five deflectors on either side, and refer you to the center deflector on each side of the trough and the openings below said center deflector.

A. I don't think I quite understand the question, but pointing to the structure R as shown in two views, above and below "Figs. 3, 4," of the drawing I count in the lowermost of said figures, six openings, which are the long opening, running at right angles to the central trough and each of which is covered by the inverted trough or deflecting plate which prevents the passage of water with air through it. I cannot regard these six openings as one open-
271 ing on each side of the central trough, but I understand them to be just what they are shown to be, to wit: a plurality of openings, which, taking both series together, extend the whole width of the ice-box, except where they are closed in the middle by the central trough T.

C. Q. 40. Referring again to the figure R, the same being one of the cuts of figure 4, is there not a central opening extending across the bottom of the ice-box, with the exception of the narrow trough above referred to?

A. Will counsel please state to what the word central in his question refers? To the ice-box or to the refrigerator?

C. Q. 41. I refer to the central portion of the ice-box, or the bottom of the ice-box.

A. There are a series of parallel openings, such as are described in the question and one of them (if there be an odd number) will be "central," in a sense, that is measuring from front to rear, but not central strictly with reference to the side passages for the ascent of air at the sides of the ice-box.

C. Q. 42. Do you think that the Hambrook invention is limited to a central opening measured from front to rear?

A. I do, or midway between the passages at the sides of the ice-box which are also from front to rear.

And thereupon a recess was had until 2 o'clock.

Cross-examination of M. E. DAYTON resumed:

C. Q. 43. Does not the Little patent, so called, show ample room for the free descent of the cold air?

A. There are two facts which prevent the free descent of cold air from the ice-chamber to the provision chamber. First, there is no opening through which warm air may enter the ice-chamber,
272 except the bottom opening from which the cold air is to escape. This fact will prevent, practically, any effective circulation. Secondly, cold air in its descent from the ice-chamber strikes the subjacent trough, C, which deflects it sidewise and upwardly, and in so far tends to prevent its free settling or descent to the bottom of the provision chamber.

C. Q. 44. Will you please state the obstacles in the Page patent, which would tend to prevent the free circulation of the air?

A. First, the free communication between the interior and the exterior of the refrigerator, through the openings, g, g of different elevations, which are favorable to the escape of the warm air, rather than its repeated circulation within the refrigerator. Secondly, the employment of several narrow passages, h^1, h^1 distributed on all

sides of the refrigerator, instead of wider passages, by which the warmer air may ascend, and thirdly, the location of the openings from the provision chamber into said passages below the top of said provision chamber, by which construction no provision is made for drawing off the warm air in the upper portion of the provision chamber.

C. Q. 45. Will not the air circulate in the Page refrigerator, as indicated by the arrows in figure 2?

A. I think not. By said arrows, air is shown to be entering the refrigerator at all its openings, and not escaping at all. This operation is plainly impossible. It is an old saying that, "what goes up must come down," and it is equally true what goes in must come out. Certainly air can't enter this refrigerator without room being made for it therein by the escape of other air elsewhere.

273 The arrangement of the openings, *g g*, with respect to each other and with respect to the passages, *b*, *b* is favorable to the admission of the outer air through the lower tubes, *g*, *g* and its escape through the upper tubes.

C. Q. 46. Aside from the openings *g*, *g*, would not the air circulate in the manner shown by the arrows, exclusively of the arrows applied to the holes *g*, *g*?

A. There probably will be such an interior circulation.

C. Q. 47. Will not such circulation cause the cold, dry air to pass through the center opening in the partition *l*, and will not the deflector plate above such partition prevent the water from dripping through said opening?

A. Yes.

C. Q. 48. Does not the construction show that the tubes, *g*, *g*, open so as to discharge the air, directly upon the sides of the ice-box A?

A. Yes; that is assuming the air enters said tubes.

C. Q. 49. Would not such air cool by its contact with the ice-box necessarily the same?

A. It would.

C. Q. 50. Is not the upper part of the partition *l*, constructed almost identically the same as the upper part of the partition or ice-bottom of defendant's refrigerator?

A. In respect of its having its upper surface flat and having an upturned flange about the opening, (which I understand to be what the question refers to) it is.

C. Q. 51. In your direct examination, you referred to the dripping of the water in the Page patent. From what portion of the structure will such water drip into the provision chamber?

A. From the ice-box through a subjacent hole in the pan beneath it. This is clearly shown in figure 2, where the ice-box has a short tube or spout leading from its bottom and depending directly

274 over a hole in the pan or bottom of the ice-chamber, so that melted water from the ice may fall in the open pail below. Defendant's model of the ice-chamber bottom in evidence shows this hole therein.

C. Q. 52. Does not the air have substantially the same circulation in the Law patent as in the Hambrook?

A. No. The trough F, with its upturned edges tends to impede or prevent the free downward movement of cold air in the center of the refrigerator and to send such cold air off to the sides of the provision chamber. The result will be an eddying and conflict of air currents, which will materially impair the circulation.

C. Q. 53. Does not the Law invention contain the double-inclined bottom pieces, the side air passages and the central opening, substantially like the corresponding parts of the Hambrook invention?

A. It does.

C. Q. 54. Will you explain in detail, the movement of the air as it passes from the ice-chamber down into the provision chamber, in the Law patent?

A. The cold air must obviously follow the directions given it by the passages through which it is sent. It will therefore, first descend into the trough F. Thence it must rise vertically at the sides of the trough until it strikes the under surfaces of the bottom boards H, H. By these it will be deflected laterally towards the opposite sides of the refrigerator. With what force and to what extent it will be projected will depend upon its relative temperature. It will, however, tend to fall also if the air in the lower part of the provision chamber be warmer as when the refrigerator is first put to use, and in doing so it will spread and encounter the rising body of warm air which it seeks to displace. There will probably
275 be a circling about or eddying of the cold air in its descent, being deflected inwardly again so as to bring the two cold currents together or towards each other; and a general movement of the warmer air up the sides of the refrigerator. When the temperature at different points of the refrigerator become nearly uniform, as will be the case after the apparatus has been some time in use, there will be a tendency to short circuits from the trough F towards the side up-passages and very little and weak circulation through the bottom of the provision chamber.

C. Q. 55. Do you think that the upturned edges of the trough F present a serious obstruction to the free movement of the air?

A. Undoubtedly. It is a well-known fact that in the transmission of steam even, through pipes having many elbows or turns, the boiler pressure may be entirely neutralized and steam emerge under practically no pressure at all. The same is true of air and other fluid currents, and such obstructions are particularly serious in refrigerators depending solely on the force of very slight differences in gravity, due to slight differences in temperature.

C. Q. 56. Do you consider that a free and rapid movement of the air in refrigerators, is a necessity and do you think that the Law refrigerator would be improved as to its circulation of air currents, if the trough F should be removed altogether?

A. Inasmuch as the refrigerator depends for its efficiency upon a circulation of air, I think it may be safely said that freedom of circulation is a thing to be desired. Unquestionably, the circulation of the Law refrigerator would be materially improved by the removal of the trough F.

276 C. Q. 57. Does not the air in the cold, dry state, descend from the ice-chamber to the provision chamber in the Law refrigerator?

A. It descends as far as the trough along with the water, and its condition will be less dry than if the water were excluded from the passage E, common to both.

C. Q. 58. Does not the air current in the Hambrook refrigerator, also descend along with the water until it reaches the trough Z?

A. Yes, but the trough Z arrests the water at the edge of the opening, and the deflector plate above said opening prevents a dripping at all points through said opening. In the Law patent, the ice may drip at a thousand points through the opening E in immediate contact with the air and continue with it until it reaches the trough which is placed beneath said opening.

C. Q. 59. In the Hambrook patent, does the deflector plate K retard or facilitate the movement of the air current?

A. It does not materially retard it, because in the sweeping course of the air downwardly at the sides of the block of ice and then inwardly towards the central opening in the bottom of the ice-chamber, it moves very directly towards the said opening and with but little or no deflection by the deflecting plate.

C. Q. 60. Supposing the deflecting plate was an upward curve of the ice-table itself over the longitudinal opening in the ice-bottom, would that make a substantial equivalent of the Hambrook deflecting plate, providing said ice-table was impervious to water?

A. The construction referred to in the question, is one which has not been before submitted to me, but on a hasty consideration,
277 I am inclined to think that this change alone would not constitute a departure from the Hambrook invention. It would be merely the embracing of the two parts—ice-rack and deflecting plate—in a single part, as for example, would be done by making the ice-rack and the deflecting plate of cast iron and casting them in a single piece, or by making them in two pieces and fastening them together, so as to be sustained by a single support. Such changes have not, I believe, been regarded by the courts as anything more than an attempted evasion of a patent, even though they may also be sometimes held to contain patentable invention themselves.

C. Q. 61. From what portion of the Law refrigerator will the water condense and drip into the provision chamber, and why will it condense at such points?

A. It is condensed on and drips from the trough, for the reason that the trough will be cooled by the cold water therein, while its under surface will be in contact with the warmer air of the provision chamber.

C. Q. 62. Does the water pass from the ice down into the trough and from thence out of the refrigerator at a temperature but a little above freezing?

A. Yes.

C. Q. 63. And will any metallic trough or vessel containing such water which has an exposed surface within the provision chamber, necessarily condense water on such exposed surfaces?

A. That would be its tendency.

C. Q. 64. Would such exposed surface so chilled by the ice-water, condense more rapidly in one portion of the provision chamber than in another?

A. It would produce that effect more rapidly in the upper than in the lower portion of the chamber, to the extent that the upper portion is warmer than the lower.

278 C. Q. 65. How rapidly do you suppose the air passes through a well-constructed refrigerator?

A. Quite slowly at best, but the more rapidly the better.

C. Q. 66. Then every obstacle which would tend to impede the flow of the air and retard its movement, would tend to impair the efficiency of the refrigerator, would it?

A. I think so.

C. Q. 67. Of your own knowledge, have you any information as to the utility or otherwise, of the Law refrigerator?

A. I have not.

C. Q. 68. I now call your attention to the A. J. Chase patent No. 95428, and ask you if such patent does not contain a substantial duplicate of one of the inclined bottom pieces of the Hambrook refrigerator, and also one of the troughs Z?

A. Yes.

C. Q. 69. Does not the air descend through a central opening in a dry condition in the Smith refrigerator, No. 293,563?

A. The air will descend with whatever drippings may form on the central imperforate portion of the ice-support I, and drop through said central opening and it will be proportionately not dry.

C. Q. 70. Supposing a deflector plate was placed over the central opening in the Smith refrigerator, beneath the ice-rest, as shown in figure 2 of the Smith patent, would such structure be an infringement on the Hambrook patent?

A. I don't think it would, for the reason that the Smith patent would then lack the characteristic features of the side passages

279 *c*, *c* terminating at the top of the sides of the ice-chamber and provided with the overhanging ledges *e*, *e*.

C. Q. 71. Do you consider the small ledges *e*, *e* of the Hambrook patent necessary elements of the invention?

A. That is my view, for the reason that they form part of the walls of the passages *c*, *c* specified in the claims and because they enter into the general purpose of the Hambrook invention of preventing moisture in the provision chamber by excluding fragments of ice therefrom.

C. Q. 72. Supposing the center piece of the imperforate ice-bottom of the Smith invention, shown in figure 2, was made of metal instead of wood, would such construction constitute a Hambrook deflector plate, or would it perform any other or different function from the wooden strip shown in the Smith patent?

A. It would operate precisely as it does now when made of wood, as I suppose it to be, and would not constitute the Hambrook invention.

C. Q. 73. Supposing that the defendant in his refrigerator used a

metal strip curved downward instead of upward, would such construction be an infringement upon the Hambrook patent?

A. The question supposes a trough presumably carrying off the drip at one end—or, it may be, at both ends—instead of at the side. I should not consider that as essentially different from the Hambrook device.

C. Q. 74. Supposing that such trough was made integral with and formed a portion of the ice-support, would it still be the Hambrook device?

A. That would not make any difference, I think.

C. Q. 75. Will you please to state what new problem was solved in refrigerators by the Hambrook invention?

280 A. He sought to solve no new problem, but a very old one, which many previous inventors had only partially solved, or had failed entirely to solve, the old problem of making a refrigerator which should most effectively give the results of free, thorough and efficient circulation throughout the entire provision chamber, and in which the provision chamber should be as free as possible from moisture. Under the first of these is included the distribution of the warm air effectively into contact with the ice, that it may be thoroughly cooled; the free discharge of the cooled air into the central and coldest part of the refrigerator; the free descent of the cold-air stream directly to the bottom of the refrigerator in said central and coolest part thereof; the ascent of the warmed air at the sides and warmer portions of the refrigerator without encountering the descending currents of cool air, and the delivery of the warmed air by the shortest and most direct possible routes to the upper part of the ice-chamber, at such points that in its descent through said ice-chamber, it must envelope the ice.

C. Q. 76. I call your attention to figure 2 of the drawings of the Hambrook patent, and ask you if the deflectors or guards *e*, *e* do not have a tendency to retard the free movement of the air?

A. Not unnecessarily. It is necessary that the air shall turn in its course from the vertical to the horizontal in order to reach and occupy the upper interior of the ice-chamber. In the absence of the guards *e*, *e* such deflection of the air current would be produced by the lid, but the lid, when opened for the introduction of ice, would not guard the vertical passages; wherefore, the guards are added, not as necessary to the deflection of the air, but as guards to the opening.

281 C. Q. 77. Do you consider that two air passages *c*, *c* are necessary in order to constitute the Hambrook invention?

A. I do. It is the law of the apparatus that there shall be two uptake flues at the sides of the refrigerator, co-operating with a central down passage for cold air in the middle and colder part of the refrigerator.

C. Q. 78. Will you explain why, in constructing this Hambrook invention, you read the guards *e*, *e* into the claim when such claim contains no reference to them and read one of the provision chambers out of the claim, when the claim expressly described and claims two provision chambers, designating the same by B, B?

A. The two questions have nothing to do with each other. Answering them separately, I reply that I consider the guards *e*, *e* as forming part of the wall of the passages *c*, *c*, which are directly referred to in the claim, and which, therefore, as much include said guards as they do any other portion of the structure by which they are enclosed. Moreover, said guards have a direct relation to one of the declared purposes of the invention.

I do not find that the Hambrook claim necessarily includes the partition for the reasons, first, that said claim in one place speaks of the provision chamber in the singular number as well as in another place in the plural number; and secondly, because the presence or absence of said partition has nothing to do with the mode of operation of the apparatus, or with the law of the invention. Really, what counsel apparently desires, is, that I shall read the partition into the claim, for the claim makes no mention of it whatever, and it is nowhere mentioned in the patent, as having any office or function in the performance of the invention. It is not as in the Sanford patent, an element of the device and

282 necessary to its operation, but it is a mere incident to the convenient subdivision of the space mentioned variously in the patent as a provision chamber, and as provision chamber B, B. In the operation of the refrigerator, it has no more effect than as though it were a foot high only, and the inventor merely means to say, I think, that it can be present or absent, or long or short, as desired. If such a partition were placed off at one side of the central opening *b*, then it would change the operation of the apparatus, and it would need to be given certain particular features of construction to enable the entire refrigerator to work. But being arranged beneath or passing through the central opening *d*, it has no more effect on the operation of the refrigerator than would an imaginary plane.

C. Q. 79. Does it not have the effect to cause the air in the provision chamber to move in one entirely independent of the movement in any of the other?

A. No more independently than it would move in one-half of the refrigerator, as to the other half, without it. In its absence, the cold air would descend in a column and separate, practically, as it does, when the partition is present, one-half ascending at one side of the refrigerator and the other half at the other. Whether present or absent, the entire body of descending air occupies the same central and coldest part of the refrigerator, and the effect upon the circulation, due to this fact, is just the same.

C. Q. 80. Do you consider that both the troughs Z, Z are necessary elements of the Hambrook invention?

A. If the question means, are two separate troughs necessary, I answer that I understand that a single trough, extending entirely around the opening *d*, would equally answer to the claim, and that the equivalent, to wit, an upturned flanges urrounding said opening, would equally be within the claim.

283 C. Q. 81. I understand, then, that you mean to say that the two troughs would be necessary, or substantially that. Am I correct?

A. No.; a single trough running entirely around the opening, and which might be designated by a single letter, would answer as well.

C. Q. 82. In the Hambrook construction, as shown in the specification and drawings, the opening extends the entire width from front to rear of the provision chamber, does it not, so that these two *thr*oughs Z, Z, are connected with the discharge pipe by a branch connection?

A. That's a fact.

C. Q. 83. With such a construction, the two troughs Z, Z would be necessary to the Hambrook invention, would they not?

A. There must be a trough at every part of the margin of the opening—a trough or its equivalent, and if it were an essential part of the Hambrook invention that the opening *d* absolutely extend entirely across the refrigerator, then two troughs would be a mechanical necessity to the construction. Even then, however, there would be no departure from the invention in connecting said trough at either one or both ends, as, indeed, the patent sets forth, may be done by the insertion of a metallic-lined recess *s*, *s*, at one end of the opening into which the troughs discharge, and which constitutes in fact a connection or extension thereof, in place of the branch pipes leading to the drain pipes z^1.

C. Q. 84. Is not the bottom of the ice-chamber in the Smith refrigerator, having a center opening and an upturned flange around said center opening, almost identical in form and structure with the corresponding part in the defendant's refrigerator?

284 A. It is, and it is in my judgment the full equivalent of the corresponding part of the Hambrook patent.

And thereupon an adjournment was had until Saturday morning, February 8, 1890, at 9 o'clock.

P. H. T. MASON,
Notary Public.

CHICAGO, ILL., *February* 8, 1890.

Met pursuont to adjournment.

Present as before.

C. Q. 85. In a previous answer you have stated that *that* the Hambrook deflector *k* did not materially retard the downward circulation of the cold air. Does such deflector plate materially assist the downward flow of the cold-air currents?

A. No.

C. Q. 86. Is a single central opening a necessary and essential feature of the Hambrook invention?

A. In the sense that the opening is central to the refrigerator, and considering the division of it, or the lack of division of it, by a partition such as is shown in the Hambrook drawing, an immaterial matter, I so regard it.

C. Q. 87. In the example of the Hambrook invention, does not the inventor show in his drawing and specification, a refrigerator having two distinct openings, one opening entering one side of one

provision chamber and the other opening entering one side of the other provision chamber, said openings having a separation between them some distance up into the ice-chamber?

A. Literally, that is true, because the single central opening between the parts of the ice-chamber bottom is literally shown as being divided by the partition *a*, which projects a short distance upward through it. In the absence of the partition, said
285 central opening would not be thus divided. It would however, still remain a central opening with respect to the refrigerator as a whole, the provision chamber as a whole and the two uptake passages *c*, *c*, equidistant therefrom. It is this relation of the central opening to the refrigerator spaces, to wit: the subjacent provision chamber and the superjacent ice-chamber, and to the laterally placed uptake passages, that its central location has its special significance. Such significance is not affected by the introduction of the vertical partition in any way, and such a partition would obviously be employed with this or any other refrigerator only when the latter is of sufficient size to require division or to make such division desirable. In other words, the partition is a mere incident of dimensions. The drawing of the Hambrook patent illustrates a refrigerator of the larger size, having such a partition and having two doors giving access to the several compartments of the provision chamber. It seems to me absurd to regard such a partition as a necessary feature of the apparatus and to insist that the apparatus must have two passages because the draughtsman chose to illustrate a large-size refrigerator instead of a small one.

C. Q. 88. Supposing a deflecting plate placed between the ice-support and the bottom of the ice-chamber over the central opening into the provision chamber were composed of a flat strip of metal placed on an incline so as to convey any water that might drip upon its upper surface entirely to one side of such opening, would such a deflecting plate be a mechanical equivalent of the deflecting plate *k* of the Hambrook invention?

A. It undoubtedly would, because it is immaterial whether it drips the water to one side exclusively, or half to each side, provided it prevents the water falling through the central opening.

286 C. Q. 89. In the Hembrook refrigerator, constructed with the inclined bottom pieces and open ice-rack, as shown and described in the Hambrook patent, would not the chippings of ice be likely to slide down and fill the troughs *z*, *z*, and also would not such pieces of ice be likely to pass down even into the provision chamber of the refrigerator?

A. Not necessarily. The deflector plate guards the opening and the inclined bottom pieces would catch ice fragments falling upon them. They are not sufficiently inclined to allow the ice to slide down them, and only water I think will reach the troughs, whether melted from the main block of ice or from the fragments that may fall upon the bottom pieces themselves.

C. Q. 90. In the example of the Hambrook refrigerator shown in the Hambrook patent, the ice-water from the melted ice drips directly upon the inclined bottom pieces, and the open ice-rack is

likely to allow small pieces of ice to fall on said bottom pieces. Such being the fact, what is to prevent the condensation of moisture upon the under side of said inclined bottom?

A. The bottom pieces referred to are of wood, lined or covered with sheet metal. The wood, the under surface of which is exposed to the provision chamber, is not a good conductor of heat, and it is less effected by the dripping of cold water from above by the application to its upper surface of the sheet metal. For this reason, there will be little or no condensation on the under surface of said bottom pieces.

M. E. DAYTON.

287 And thereupon JOHN BUCKLEY, a witness produced on behalf of complainant, being first duly sworn, testifies in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. John Buckley; age, fifty-five years; residence, 308 W. Madison street, Chicago; occupation, hardware merchant.

Q. 2. Do you deal in household refrigerators?

A. Yes, sir.

Q. 3. From whom have and do you purchase the same?

A. I have purchased and sold refrigerators of R. T. Hambrook; also Booth & Osgood, and afterwards the Belding M'f'g Co.

Q. 4. Do you recollect ever selling a refrigerator to Mrs. P. Lowe, of No. 731 Monroe street, Chicago.

A. Yes, sir.

Q. 5. Can you give the date when you made such a sale?

A. I think it was in 1884.

Q. 6. Have you any memoranda which will enable you to fix the date more accurately?

A. May 12, 1884.

Q. 7. Did you make the memorandum on the card which you now hold in your hand?

A. Yes, sir.

Cross-examination waived.

JOHN BUCKLEY.

288 And thereupon LODORE D. TANNER, a witness produced on behalf of complainant, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. Lodore D. Tanner; age forty-four years; residence 326 W. Fulton street, Chicago; occupation, engineer with Belding Bros. & Co., 185 Fifth Ave., Chicago.

Q. 2. Are you acquainted with George R. Hotchkiss, formerly in the employ of the Belding Manufacturing Company?

A. Yes.

Q. 3. Do you know about the date when Mr. Hotchkiss left the employ of that company?

A. Well, not very near, but I think it was the latter part of 1888.

Q. 4. If you have any means of knowing the relations that existed between Mr. Hotchkiss and the Belding M'f'g Co., please state as fully as you please what those relations were during the time of his employment with the company? If you have any special knowledge of any circumstances that occurred after Mr. Hotchkiss left the employ of the Belding Company, or if you have had any conversation or conversations with Mr. Hotchkiss, before or since his employment by the Belding Company, which in your opinion would show what his relations were or are toward the Belding Company, you may state as fully as you please, such circumstances and conversations and the dates when they occurred, as nearly as you can recollect?

289 (Counsel for defendant objects to the question as calling for irrelevant and immaterial testimony.)

A. Well, the only way that I have of knowing about the relations is through Mr. Hotchkiss himself, and by what he has told me. For at least a year and a half that he worked for them, he felt very bitter towards the company; often spoke of the company as a "lot of fools" and thought that he was setting around there asleep all the time, and there was a great deal going on in the office that they didn't think he knew anything about; that he had seen a good many papers from the office that he knew they didn't want him to see. He has often spoken of Mr. Belding as a "damned old hog and a damned fool." All this conversation so far was while he was with the company. I didn't know the man before he was working for them. After he quit the company—I can't place the date, but it was about a year ago, he was down in the boiler-room one Saturday and asked me if I was going to be there the next day, and I told him I was, that I was coming down to wash out the boiler. He said that would just do him, as he wanted to come in and measure the refrigerators, get the dimensions of the panels, and after he went away I got to thinking the matter over and thought it was strange that he should want to come in on a Sunday, he having the freedom of the house during the week, so I spoke to the firm about it, and they told me not to let him in. He did come down the next day, but I didn't open the door for him.

The next day he came down to see me and said that he was down but didn't get in, and I told him that I heard him at the door, and he says, "I wonder who told the firm that I wanted 'to get in here.'" I told him I did, as I thought it wasn't just right
290 to let him in without speaking to them about it. The exact words that he used were, "The God-damned old fool, just as though I couldn't get the sizes of the refrigerators without coming in here." Now the date, I can't place the date. I only know that it was shortly after he gave up the business in Eau Claire. That was the first time that I had seen him since he came from Eau Claire.

Q. 5. Was the office and salesroom of the Belding Manufacturing Company in the same building occupied by Belding Bros.?

A. Yes.

Q. 6. Where did these conversations between yourself and Mr. Hotchkiss occur?

A. In the boiler-room, in the basement of that building.

Q. 7. Do you know whether or not Mr. Hotchkiss had any personal altercation with any officer of the Belding Company?

(The question is objected to as irrelevant and immaterial.)

A. No, I do not.

Q. 8. State whether or not, Mr. Hotchkiss, in your presence or to you, made any threats against any officer of the Belding Company, or against the company?

(Last objection repeated.)

A. Only in this way; that he would get even with them, if he lived long enough. He spoke that way a great number of times against the company and Mr. Belding in particular.

Cross-examination waived by counsel for defendant.

LODORE D. TANNER.

291 And thereupon WILLIAM A. STANTON, a witness produced on behalf of complainant, being first duly sworn, testifies in answer to interrogatories propounded to him by T. E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?

A. William A. Stanton; age forty-six; residence, Chicago; occupation, merchant.

Q. 2. You have testified heretofore in this case, have you not?

A. Yes, sir.

Q. 3. At the time you became receiver of the Booth & Osgood Manufacturing Company, state what refrigerators were being manufactured by that company?

(Counsel for defendant objects to the question for the reason that it is a repetition of testimony already given in this case by this witness.)

A. The Hambrook patent refrigerator.

Q. 4. What style of ice compartment was used in those refrigerators?

A. Inclined bottom.

Q. 5. About how many refrigerators, manufactured or in process of manufacture, having an ice compartment with an inclined bottom, were on hand when you became receiver?

A. I think there was between seven and eight hundred.

Q. 6. What was done with those goods?

A. [illegible]uncompleted ones were completed, and all of them, or [illegible]them, sold the next season.

292 Q. 7. State whether or not, during your receivership, any complaints were received by yourself or those under you, regarding the inefficiency of any of these refrigerators, or of any inclined-bottom ice-chamber refrigerators previously manufactured by this company?

A. I think that I did have two or three complaints, that is something that always occurs in a business of that kind, but they didn't amount to anything. The refrigerators were generally considered as one of the best in the market.

Q. 8. About how many refrigerators were manufactured by you during your receivership?

A. Including those that were on hand at the time I was appointed receiver, I made about 3,500 or 3,600.

Q. 9. Were they all of the same interior construction?

A. All the new goods that I made were made with the flat-bottom ice-chamber. Of course I don't count those which were in process of manufacture with the inclined bottom. I completed those, and made about 2,700 new ones with the flat bottom.

Q. 10. Was Mr. George R. Hotchkiss in your employ as receiver, and if so, in what capacity?

A. I was appointed receiver about the 14th of November, and the following January I engaged Mr. Hotchkiss as traveling salesman.

Q. 11. About what date did the Belding Manufacturing Company start up its factory at Belding?

A. At about the first of September, 1884.

Q. 12. Was Mr. Hotchkiss given employ with the Belding Manufacturing Company at that time?

A. We engaged Mr. Hotchkiss about that time, but I cannot tell whether it was just before or just after the first of September.

293 Q. 13. Did the Belding Manufacturing Company begin the construction of refrigerators immediately upon the opening of its factory at Belding?

A. Yes, sir; it did.

Q. 14. And what refrigerators were then manufactured?

A. The same refrigerator that I made while I was receiver of the Booth & Osgood Company. When we bought that plant there was quite a large number of refrigerators at Belding in process of manufacture which we completed, and some parts of refrigerators which we bought from Mr. Vail, which were at the Chicago factory.

Q. 15. In what capacity was Mr. Hotchkiss employed in 1884 by the Belding Manufacturing Company?

A. As traveling salesman only.

Q. 16. I read you, without reprinting the same at this place in the record, question 6 and question 7, and the answers thereto of the direct examination of George R. Hotchkiss in this case, and ask you whether or not you agree or differ from the statement made by Mr. Hotchkiss in his said answer, and if you differ, then state fully your knowledge of the matter herein inquired of.

A. The statement that Mr. Hotchkiss made, that he went to work for the Belding Manufacturing Company under an arrangement that [illegible] agreement that he was to make just such a refrigerator from Eau

pany as he had a mind to, is absolutely false, as is also the statement that they were to be made under his direction, and that he had refused to go into the company if they were to manufacture the Hambrook refrigerator. Mr. Hotchkiss was very anxious to work for us, and Mr. Belding did not want to employ him. We were therefore discussing the matter with him for several
294 weeks before we made a contract with him. We never manufactured any goods under Mr. Hotchkiss' direction or plan, or from drawings made by him, as he states.

In reply to Mr. Hotchkiss' statement, that after his talk with Mr. Belding, he came to me, and that I told him that it was impossible for us to start up the factory, as we had no person there who knew anything about the manufacture of refrigerators, I will say that no such conversation ever took place; that the factory was running before Mr. Hotchkiss went there. I never told him that we did not intend to manufacture the Hambrook refrigerator, or that he was to go there and take his own drawings, as I never knew that he had any drawings of refrigerators. I never told him that the refrigerators were to be built just exactly as he wanted them.

The reason we sent Mr. Hotchkiss to the factory was, that we had nothing for him to do here, and knew that he understood when the goods were made right. We sent him to the factory, and gave him orders to see that the goods were properly finished outside and inside; that the zinc was properly put in, and that the work was done in a proper manner, but under no circumstances to make any changes in the construction of the goods without first consulting us. Mr. Belding and I knew that Mr. Ranney, who was superintendent and manager of the factory, was a very peculiar man, and did not wish to be interfered with in his management of the factory, and we were, therefore, very particular in regard to the instructions we gave Mr. Hotchkiss.

Q. 17. Did you, or to your knowledge did any other officer of the Belding Manufacturing Company, ever give Mr. Hotchkiss to understand that said company did not intend to or was not
295 manufacturing the Hambrook refrigerators or a refrigerator made under the Hambrook patent?

A. There was no one that had any authority to give any such instructions except Mr. Belding and myself. I know that I never told Mr. Hotchkiss anything of the kind, and am very positive that Mr. Belding did not.

Q. 18. State whether or not it was understood among the officers of the company that the Belding Manufacturing Company, was not manufacturing a refrigerator under the Hambrook patent?

A. No, sir, it was not so understood. It was understood that we were to make the same refrigerator as I had made when receiver of the Booth & Osgood Company.

Q. 19. I read you C. Q. 113, and the answer thereto, of the deposition of George R. Hotchkiss in this case, and ask you what you know about the manufacture of a special refrigerator intended to be used at the Cincinnati Exposition?

A. I will say that Mr. Hotchkiss never made any request of me

that two men should be placed at his disposal to manufacture a refrigerator for any purpose whatever, and that I never gave him any order to the foreman of the factory to place two men, or any number of men, at his disposal for that purpose. All the truth there is in this answer of Mr. Hotchkiss is, that he came to me at one time and spoke about having two or three refrigerators finished in extra good shape to be sent to Cincinnati for the exposition there, and that the refrigerators sent to Cincinnati at that time were exactly like those I made during my receivership, except that they had a little finer finish.

296 Q. 20. I read you Q. 33, and the answer thereto, of the deposition of George R. Hotchkiss, and ask you if said answer is true?

A. Well, Mr. Hotchkiss did own four shares of stock in our company for a short time previous to his leaving us. We thought that it would encourage him and help him in selling goods to say that he was a stockholder and we therefore let him have four shares of stock. I am not sure whether it was three or four shares, not over four.

Q. 21. In answer to Q 35, Mr. Hotchkiss says in his deposition that it was not until after the first year's output on the market that the Belding Manufacturing Company placed any patent mark on its refrigerator?

A. That is not true. Some of the goods made the first year were not marked patented and some of them were.

Q. 22. State under what circumstances the refrigerators sold by the Belding Company to the Simmons Hardware Company of St. Louis, Buell, Sons & Company of Detroit, and Spear & Converse of Chicago, were provided each with a separate mark or plate and were not marked patented under the Hambrook or any other patent, if they were not?

A. The goods made for these parties were made under their special brand, and under the agreement that they were to have no marks of any kind to show that they were made by the Belding Manufacturing Company.

Q. 23. I read you cross-question 95 of the deposition of George R. Hotchkiss and the answer thereto, and ask you whether you or any other officer of the Belding Company ever held the conversation with Hotchkiss therein referred to?

297 A. I never held any such conversation with him, and I do not think any other officer of the company ever did, as Mr. Hotchkiss never made any claim of that kind, but in all conversations with me regarding the matter claimed that we were entitled to the patent mark, as the goods were made under the Hambrook patent.

Q. 24. State what were the relations of Mr. Hotchkiss with yourself or other officers of the Belding Company at the time of leaving the employ of the company, and whether or not those relations, whatever they were, are changed, and if so, how and what?

A. Up to the time Mr. Hotchkiss left the employ of our company, his relations with me were always of the pleasantest kind; but he

and Mr. Belding did not get along very well, as Mr. Hotchkiss, for some reason, did not seem to like Mr. Belding. Since Mr. Hotchkiss left the employ of our company my relations with him have always been very friendly, but he has been very unfriendly and against Mr. Belding, and has expressed himself to me at two different times very freely regarding the matter. At these two times, he told me that Mr. Belding was "an old hog," and that he would get even with him yet.

Q. 25. Do you know anything about the circumstances of Mr. Hotchkiss' attempt to gain admission to the Belding Company's place of business after he had left the employ of the company; and if so, state fully your knowledge of that matter?

A. Mr. Tanner, our engineer, told Mr. Belding and I one day that Mr. Hotchkiss had been to him and asked him if he would be at the store Sunday morning, and if so, that he would like to come in and take the measurement of our different-size refrigerators. We told Mr. Tanner not to admit him, and he did not.

298 Cross-examination by counsel for defendant:

C. Q. 1. What proportion of the refrigerators manufactured by you as receiver were single, and what proportion double doors?

A. I could not answer that question, because I do not know.

C. Q. 2. State as near as you can, the approximate proportion?

A. I couldn't give any approximate proportion in the matter. I never kept any record of it, and I haven't the slightest idea.

C. Q. 3. Have you any record of the number of refrigerators which you received of the Booth & Osgood Manufacturing Company, completed or partially completed?

A. I have at my office, the inventory taken at the time I was appointed receiver.

C. Q. 4. Can you state what such inventory shows?

A. Not exactly, but, as I stated in my direct testimony, I think there was between 700 and 800 on hand at that time which were completed.

C. Q. 5. Have you any memorandum showing the number of refrigerators manufactured by you as receiver, altogether?

A. I have not, but the statement I made in my direct testimony, I get from the number I sold and those on hand when I made the sale to Mr. Vail.

C. Q. 6. What number did you sell to Mr. Vail?

A. I couldn't tell you now.

C. Q. 7. You sold and closed out to Mr. Vail all the refrigerators which you manufactured yourself during the time that you were receiver, as well as all those which you received as part of
299 the assets of the Booth & Osgood Manufacturing Company, which were on hand at the time you closed up your business as receiver?

A. I sold to Mr. Vail all the refrigerators and parts of refrigerators that I had on hand at the time of the sale.

C. Q. 8. And this total amount, including what you sold during the time that you were receiver, was something like 3,600?

A. Yes, sir.

C. Q. 9. Can you state about the number which you sold as receiver prior to the closing out of the business to Mr. Vail?

A. No, sir, I cannot.

C. Q. 10. Is it a fact that you had a considerable stock of refrigerators on hand, at the time of the sale to Mr. Vail?

A. No, sir; I think that I had a very few refrigerators on hand at that time, as I had tried to close out all I had before the season was over, and the season was practically over before I had any talk of a sale to Mr. Vail.

C. Q. 11. Did you not obtain an order from the court which appointed you receiver, to sell and close out the entire assets of the Booth & Osgood Manufacturing Company, for the sum of $700?

A. No, sir, I didn't.

C. Q. 12. Did not the court make an order, dated August 5, 1884, authorizing you to sell such property for $700?

A. No, sir, it did not.

C. Q. 13. Did not you file a petition in said court about June, 1884, asking leave to sell and stating in substance that $700 was the best offer you could get for the property?

300 A. No, sir, I did not.

C. Q. 14. Did the refrigerators manufactured by you as receiver, give as good satisfaction as those manufactured by the Booth & Osgood Company, previous to the time of your appointment as receiver?

A. I can't answer that question because I don't know what satisfaction the Booth & Osgood Company's goods did give, except in a very few cases.

C. Q. 15. Had you any knowledge whether or not, the goods manufactured by the Booth & Osgood Manufacturing Company, were constructed in a better manner than those manufactured by yourself as receiver?

A. No, sir, I had not, only from hearsay.

C. Q. 16. During your administration of the Booth & Osgood Company's business as receiver, was the question ever raised, to your knowledge, as to whether the goods manufactured by you were equal to, or superior, to the Booth & Osgood previous output?

A. During the time I was receiver, I had complaints from some of my customers, that the goods were not as well constructed as those they had had from the Booth & Osgood Company.

C. Q. 17. Did you, as receiver, have any litigation, growing out of what was claimed by purchasers, to be a defective construction of the refrigerators?

A. I don't think I ever had any litigation, but I had quite a number of complainants and made allowances to several customers for claims of this nature.

C. Q. 18. Did not Charles Sawyer & Company file a petition in the superior court of Cook county in chancery, for the purpose of

avoiding a contract made between said Sawyer & Company and yourself as receiver, for the purchase of refrigerators?

301 (Objected to as immaterial and as irrelevant, the subject-matter of the contract and its avoidance having no reference to this case.)

A. I never did business with any firm by the name of Charles Sawyer & Company during the time I was receiver.

C. Q. 19. Did not Clark, Sawyer & Company file a petition in the superior court of Cook county in chancery, for the purpose of avoiding a contract made between said Sawyer & Company and yourself as receiver for the purchase of refrigerators?

(Last objection repeated.)

A. They may have done so, but I do not remember now whether they did or not.

C. Q. 20. Did you not file an answer to the petition of Clark, Sawyer & Company, in which you state as follows: "This respondent further answering, denies that the said refrigerators and chests were not made as represented, and denies all the allegations in said petition in regard to the defects in the construction of the said goods; and that this respondent claims that the said refrigerators and ice-boxes were and are fully equal in quality to those made by said Booth & Osgood Manufacturing Company in previous years," and was not such answer sworn to on the 9th day of April, 1885, before T. Lyle Snedes, notary public, and duly filed in said court April 9, 1885?

(Counsel for complainant objects to the question as irrelevant, immaterial and incompetent, as not being proper cross-examination, and at best as being secondary evidence, the said answer itself, or a certified copy thereof being the best evidence.)

302 A. I do not remember now whether I filed such an answer or not; if I did, it was undoubtedly sworn to, and the statements made therein were true, to the best of my knowledge and belief.

C. Q. 21. Is it not a fact that you had a contract with said Clark, Sawyer & Co. for the sale of refrigerators to them?

A. I think I did, but I am not positive in regard to that matter.

C. Q. 22. Is it not a further fact that in order to make a settlement with Clark, Sawyer & Co., you were compelled and did make a very large reduction in the price of refrigerators sold to them?

A. As I stated before, I have no recollection of any suit of this kind having been brought, and therefore do not know whether I made them an allowance or not. The matter happened so long ago that I don't remember anything about it.

C. Q. 23. What proportion of the 3,600 refrigerators which have been referred to as manufactured by you or received by you as receiver were what has been termed ice-boxes?

A. As I answered before, I could not tell you, because I never kept any record of the matter.

C. Q. 24. Does the 3,600 include all classes and kinds of refrigerators and ice-boxes which were sold by you?

A. Yes, sir.

C. Q. 25. Of the 800 refrigerators received from the Booth & Osgood Company, what proportion were completed when you received them?

A. I think I testified in my direct testimony that there was between seven and eight hundred completed.

C. Q. 27. How many did you receive which were partly completed?

303 A. I couldn't answer that because I haven't looked the matter up.

C. Q. 27. Were you at work for or interested in the Booth & Osgood Manufacturing Company?

A. No, sir, I was not.

C. Q. 28. What styles of refrigerators were the refrigerators manufactured by you in competition with?

A. Well, there was quite a number of other manufacturers in the market, and I couldn't you all of them. There was the Alaska, the Pierce, and several other makes.

C. Q. 29. Were all the flat-bottom refrigerators manufactured by you, as receiver, manufactured on the same plan and having the same form of structure, referring to the double-door refrigerators?

A. Yes, sir; practically the same.

C. Q. 30. Were all the single-door refrigerators manufactured by you, as receiver, constructed on the same plan?

A. Yes, sir.

C. Q. 31. Is it not a fact that you manufactured more single-door refrigerators than double-door refrigerators?

A. I couldn't say as to that, because I don't know. There may have been more single-door refrigerators on hand when I took hold of the business. That is something that I have no record of.

C. Q. 32. When did you first become interested with Mr. Belding in refrigerators, or the refrigerator business?

A. About the time the Belding Manufacturing Company was organized.

(We will offer in evidence, as part of this cross-examination, a certified copy of the order dated August 5, 1884, authorizing
304 the receiver to sell the assets of the Booth & Osgood Manufacturing Company; also the petition on which said order was based; also the answer of William A. Stanton, receiver, etc., filed April 9, 1885.)

(Such exhibits, hereafter to be produced by defendant, are here objected to by counsel for complainant, as incompetent, irrelevant and immaterial.)

WILLIAM A. STANTON.

And thereupon a recess was had until 2 p. m.

2 O'CLOCK P. M.

Met pursuant to adjournment.
Present as before.

And thereupon, by consent, the further taking of rebuttal testimony is adjourned until Tuesday, February 18, A. D. 1890, 9 o'clock a. m., at the same place.

P. H. T. MASON,
Notary Public.

CHICAGO, ILLINOIS, *February* 18, 1890—9 o'clock a. m.

Met pursuant to adjournment.
Present: Taylor E. Brown, Esq., counsel for complainant, and Edward Taggart, Esq., counsel for defendant.

ROBERT D. O. SMITH, a witness called on behalf of complainant, being first duly sworn, on oath deposes and says in answer to interrogatories propounded to him by TAYLOR E. BROWN, Esq., counsel for complainant, as follows, to wit:

Q. 1. What is your name, age, residence and occupation?
305 A. Robert D. O. Smith; age, fifty-seven; residence, Mishawaka, Indiana; occupation, secretary of the Dodge Manufacturing Company of Mishawaka.

Q. 2. You have testified before in this case as an expert, have you not?

A. I have.

Q. 3. Have you read the deposition of defendant's expert witness, J. W. See?

A. I have.

Q. 4. Have you examined and do you understand the construction and mode of operation of each of the following letters patent and models introduced as exhibits herein on behalf of the defendant, to wit:

Banta	patent,	No.	60665	of	1867.
Koch	"	"	77624	"	1868.
Chase	"	"	95428	"	1869.
Little	"	"	129,671	"	1872.
Harris	"	"	61734	"	1867.
Law	"	"	62643	"	1867.
Page	"	"	175,143	"	1876.
Rohrer	"	"	121,899	"	1871.
Yost	"	"	23803	"	1859.
Hunt	"	"	4789	"	1872, reissue.
Butler	"	"	161,928	"	1875.
Lyman	"	"	14510	"	1856.
Smith	"	"	193,563	"	1877.
Smith	"	"	8463	"	1878. "
Sanford	"	"	13802	"	1855.
Sanford	"	"	455	"	1857. "

Defendant's Exhibit Page Model.
" " Rohrer "
" " Hunt "

A. I have and do.

306 Q. 5. Please compare the said exhibit models and letters patent referred to in the last preceding question with Complainant's Exhibit Hambrook Patent No. 204,216, and state whether or not in your opinion, the invention described and claimed in said Hambrook patent is found in or suggested by anything contained in either or all of defendant's said exhibits, giving the reasons for any opinion you may express?

A. I do not think the invention described and claimed by Hambrook is either anticipated or suggested by anything found in either of the exhibit patents referred to in the question. In giving my reasons for this belief, it will be proper first to say what I understand to be the purport of Hambrook's patent.

The general facts connected with refrigerators in such structures as domestic refrigerators have been long known. That is to say, it has long been known that cold air will descend and warm air will ascend, and that these movements of the air may be caused by a cold body like a lump of ice. This general physical fact has been made use of in refrigerators, and was well understood long before Hambrook's invention. Consequently no interpretation of his patent can be made upon common-sense principles, which will render it broad enough to cover what was previously known. The plain provision of the statute is that the patent must be understood to cover something which was not previously known. Another plain provision in the statute is that an improvement in any particular thing or machine may be patentable, provided an improvement in that thing is thereby effected. With reference to this, I feel it proper to say that my understanding is that an improvement in an article is mainly to be gauged by the public appropriation of it, and that

307 it may consist in a production of a better result *per se* or in as good a result at a cheaper rate, in either case the public service is enhanced and public performance manifested. This opinion may not be strictly within my province as an expert witness, but I have been asked for my reasons, and it therefore appears proper to state the basis of belief upon which these reasons are founded.

All patents and patentable inventions are based upon known laws, and are exemplified by varied use and combination of known mechanical powers and appliances, considered singly, the same power or appliance always produces the same effect whenever or however it may be employed, and if it were proper to consider an improved machine with reference to the functions of its several parts, separately considered, it would be impossible either to obtain or maintain a patent. After a practice of nearly thirty years, it is my belief that I have not seen a single mechanical patent which could not be dissected and shown to be devoid of patentability by that method.

Manifestly, a course of reasoning which would lead to that result is not in accordance with the intention of the statute, nor with the decisions of the courts.

In applying these ideas to the case in question, I find that the

foundation fact of aerial circulation within a domestic refrigerator, due to the presence of ice in the upper part of the chamber, was well known long prior to Hambrook's patent, and that a large number of prior patents exhibit attempts to utilize it These two facts show clearly, first, that no broad claim in Hambrook's patent was intended or possible, and second, the claim which was granted him must refer to details wherein he differs from others, not in general purpose, but in adaptation to that purpose.

In considering this matter of details in a refrigerator, it
308 is necessary to consider the attending conditions and objects.

The conditions are a comparatively small inclosure with walls made slow conductors of heat, and a quantity of ice in the upper part of that chamber, and food substances, warm in comparison to the ice, placed in the lower part of the chamber. The general purpose is to cool and preserve the substances in the lower part of the chamber.

The effects aimed at under these conditions and purposes are, first, a refrigeration of the air in the upper part and a condensation of its moisture by contact with the ice; second, a descent of said refrigerated air upon the substances below and an abstraction of their heat by the cold air, which is thereby warmed and rarified, and a return of such rarified air to the ice, where it is again cooled, and so on. But a controlling condition is the small difference in temperature at top and bottom of the refrigerator.

This is a controlling condition because the circulation depends upon a difference, and the more minute that difference, the feebler will be the moving force and the more easily will it be neutralized by obstructions. This is the key to this case. Of all the letters patent cited, to me Hambrook seems to be the first and only one who appears to have comprehended the feebleness of these forces, or intelligently sought to offer the least possible impediment to their action. In that, appears to my mind, to be the merit of his improvement.

Having now indicated the basis of the opinions I shall express, I will consider the several instances mentioned in the question.

The statement of the invention set out in the second papagraph of the specification of Hambrook's patent and in the claim, are
309 in harmony with the views I have given above. In the drawing it appears that the movements of the air are provided for by an arrangement of parts which, while they direct such movements, do so with the least possible obstruction to the feeble forces present, and therefore secure the best possible results.

Among the alleged anticipating patents, that of Sanford, No. 13802, November 13, 1855, is the earliest. It expired more than eight years before Hambrook's patent was issued. Whatever invention it contained had been added to the common stock, of which Hambrook had a right to avail himself as well as others. So far as a consideration of the art here is concerned, it may be regarded as the foundation on which all other refrigerators have been built, and with which all must be contrasted. It is evident to the eye that it contains the principle heretofore spoken of. The ice is in the top,

the food is below. The ice is expected to refrigerate the air, which will then descend upon the food, be warmed, and ascend again to the ice, and so on.

It seems hardly credible that all the subsequent patents on refrigerators have been improvidently granted and are invalid, because of the invention of Sanford, and if they are not so invalid, it must be, because they differ from Sanford in some substantial particular.

It is not difficult to show that Hambrook differs as greatly from the others, as any of them do from Sanford. Sanford's refrigerator is defective in the arrangements which obstruct the feeble currents; the very particulars in which Hambrook is superior. These obstructions consist in numerous changes of direction in its course, in numerous restricted openings through which it has to pass, in being permitted to ascend to a considerable height above the ice,
310 whence will have to descend either by force of the ascending current, or by slow refrigeration at a distance above the ice.

The opening in the drip bottom below the ice is also obstructed to the free passage of the cold air by the funnel of the drip-cup, which compels the descending air to change its direction.

The patent to A. S. Lyman, 14510, is subsequent to Sanford and presents nothing more than a modification, as it embraces the same physical principles precisely. It differs from Sanford and from Hambrook in the arrangement which requires the cooled air to descend to the bottom of the refrigerator before it can come in contact with the substances to be cooled. This is a serious defect and obstructs circulation by delaying the rarefaction of the air after it has left the ice.

The patent to Banta, 60665, represents the cooled air as descending from the ice along with the drip-water, over an inclined bottom nearly to one side of the refrigerator, then reversing its direction around the edge of that board and entering the provision chamber in a horizontal direction, then downward and upward again through a perforated shelf, then up a side passage and down another to the bottom of the ice. Such a roundabout course would undoubtedly destroy or prevent any effective circulation.

The patent to Koch, 77624, has no provision to facilitate circulation. It is a chamber partially submerged with a covered hole in the top and a pan of ice above it; the descending and ascending currents, if there are any, enter and depart through the same opening. It needs a pretty refined imagination to see a likeness of details to Hambrook.

The patent to Chase, 95428, has a roundabout passage,
311 starting from the provision chamber into the roof over the ice and down again into the ice-chamber. This downward part of the passage is the worst feature, as it is evident the descent of the air from the top of this passage to the ice must be, under compulsion of the ascending warm air, and is so much out of the feeble force upon which circulation depends. It seems evident that the air in passage *c*, being warmer than the ice, will not go downward without force.

The patent to Little, 129,671, presents again the obstructions due to throttled-air passages and an obstructing drip-pan, which will not let the cooled air descend to the provision chamber without a change of course. The orifices, *e*, communicate with the outside air, and no means are shown whereby the air, warmed by the provisions in the lower chamber, can enter the ice-chamber, and it therefore is doubtful if there can be any circulation of air whatever.

The patent to Harris, 61734, presents another instance of obstructed passages. The air, warmed by the substances to be cooled, is expected to pass through the small opening, *y*, and exit. Fresh air is expected to enter somewhere, pass between the walls of the structure into the ice-chamber, etc. The actual circulation under these circumstances is confined within the imagination of the projector.

The Law patent, 62643, presents an efficient obstruction in the drip-trough F, the edges of which rise past and overlap the edges of the partition plates, H. Air descending from the ice-chamber must enter the drip-trough and reverse its direction twice before reaching the provision chamber below. Besides, the passage out of said drip-trough is so restricted that it must throttle the flow materially.

312 The Page patent, 175,143, presents a singular arrangement of obstructing passages let into the walls of the refrigerator. The upper half of the provision chamber affords no outlet for the air warmed by the food substances.

The patent to Rohrer, 121,899, presents the defects of Sanford, from which it only slightly differs. The rising air goes to the apex of the roof, some distance above the ice, whence it will only descend by pressure, while its flow downward after refrigeration is obstructed by many angular troughs and angular covering plates. There also appear many obstructing shelves, etc.

The patent to Yost, 25803, does not provide for any circulation, such as is contemplated by Hambrook. Fresh air is expected to come in, flow around the ice-chamber, past a variety of obstructing plates, down into the provision chamber, and thence out again to the open air. I do not regard this patent as exhibiting anything which is pertinent to Hambrook.

The patent to Hunt, 4789, presents a circular refrigerator with an ice-chamber having radial slits in its bottom for the passage of the cooled air. Each slit has its edges upturned and is covered by a plate having its edge down-turned so that the air in passing through said slit, must change its direction twice. This and the restricted openings near the top of the ice-chamber present efficient obstructions to greatly impede, if not entirely prevent the desired circulation.

The patent to Butler, 161,928, presents the defects of Sanford. The passage of air downward through the central opening under the ice is obstructed by the drip-pan, and the ascending air rises to the extreme top of the structure, whence it must be caused to descend by force.

313 The patent to Smith, 193,563, presents the same obstructive features which have before been pointed out. The rarefied

air ascends to a passage in the cover, whence it will only descend to the ice by an application of force, and adequate force is not present; otherwise this inventor must have anticipated Hambrook. This defect shows that he was after all, merely groping after something and that he had no clear ideas as to how to reach the object he had in mind.

I think it cannot be disputed that the features which I have pointed out as defects, are defects, because they obstruct the exceedingly feeble currents within a domestic refrigerator. Those obstructive features are absent from Hambrook, and on the other hand, Hambrook has evidently comprehended these points and has intelligently arranged all the parts of his refrigerator with reference to them. The air cooled by the ice falls with the least possible impediment into the provision chamber. It is not anywhere compelled to reverse its course, nor scarcely to change it. When it has again been rarefied by contact with the warm substances in the lower compartment, it rises freely through the side passages to the level of the ice, whence it is deflected horizontally to impinge on the ice. The central opening is covered by a plate which does not in any way or degree, impede the passage of air, while it does prevent the drip of water into the provision chamber. I find no difficulty in believing that the Hambrook patent is not anticipated by either or any of those cited.

Q. 6. State whether or not anything contained in the Defendant's Exhibit Letters Patent, or either of them, or in the statements of the deposition of defendant's expert, Mr. See, which you have read, causes you to alter or modify in any way the opinion you
314 have expressed in your *prima facie* deposition in this case regarding the interpretation of the claim of the Hambrook patent, as you then understood it, and your opinion as then expressed that the defendant's construction of refrigerators contains the invention described and set forth in the claim of the said Hambrook patent?

A. I have read Mr. See's deposition but I do not wish to modify or alter any opinion which I have given or expressed in this case.

Cross-examination by defendant's counsel, Mr. TAGGART:

C. Q. 7. Will you please examine the specification of the Hambrook patent, and read therefrom the portion, which in your opinion, clearly describes the improvement made by Mr. Hambrook in refrigerators, pointing out wherein that improvement is in advance of all previous refrigerators?

A. I do not think the specification of the Hambrook patent was drawn with great skill, but taking the description specially referring to the second paragraph thereof, in connection with the drawings, I have found no difficulty in perceiving the particular in which this refrigerator excels all those which have been referred to me as anticipations in this case, and those particulars I have endeavored clearly to set forth in my answer to question 5.

The second paragraph of this patent is in these words: "The

nature of my invention consists in the construction of a refrigerator having the ice-chamber constructed in such a manner that the air will impinge upon the top, bottom and sides of the ice, and that the continuous volume of cold air generated by the melting of the ice will descend in a dry state to the provision chamber without
315 material hindrance, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending current of cold air."

This description of the essence of the invention is exemplified by the drawings, and is strictly in conformity to the opinions I have heretofore expressed, and in this refrigerator the parts are for the first time so arranged as to interpose the least possible obstruction to the feeble circulation of the air within a domestic refrigerator. The remainder of the specification is only a detailed description of what is shown in the drawings. This, I think, answers the question.

C. Q. 8. What meaning do you give to the term impinge, as used in the Hambrook specification?

A. Impinge means to strike upon, and in the connection in which it is used in the Hambrook specification, it is implied that the air will be directed against the top, bottom and sides of the ice. I think that the use of the word bottom in this connection is not strictly correct.

C. Q. 9. Can the air current, in a construction like the one shown in the Hambrook specification and drawings, impinge upon the bottom of the ice?

A. Well, I can't say that it is impossible, because it is easy to imagine lumps of ice to be piled in the refrigerator in such a way that these currents might impinge upon the top, sides and bottom.

C. Q. 10. At the date of the supposed Hambrook invention was it a novelty to construct a domestic refrigerator having the air passages so arranged that the air would impinge upon the top, sides and bottom of the ice in the ice-chamber?

A. As to that I only know from what is before me in the
316 cases referred to, and I do not think in either one of those the expression occurs, nor is the construction shown in any of them so well adapted for that result as the Hambrook, but that only constitutes one point of the Hambrook invention.

C. Q. 11. How long do you understand it would take for the air within a refrigerator to make an entire change, or, in other words, to pass entirely through the cold-air opening from the ice-chamber to the provision chamber?

A. That question is impossible to answer. It would depend entirely upon the differences in temperature between the ice and the top of the refrigerator, and substances placed to be cooled in the bottom of the refrigerator.

C. Q. 12. Did you ever make any test in a domestic refrigerator, for the purpose of ascertaining whether or not you could detect any current of air at all?

A. I did not, but I have many times witnessed the fact that a

current existed, and I know from principles of physics that the proper conditions of currents must exist.

C. Q. 13. Would there not be a current, even though the refrigerator is provided with no partitions or flues, if a body of ice was suspended within the upper portion of the chamber within the refrigerator?

A. There would be, and in some respects that would be the preferable mode, if it did not involve highly objectionable conditions.

C. Q. 14. Would not the construction and arrangement of the ice within the chamber, as supposed in my last question, give the most rapid air currents that could be produced in a refrigerator?

A. It might, or it might not. It might if the spaces surrounding
317 were very ample, as it has been found that ascending and descending currents will select for themselves separate lines when the spaces are sufficient. I do not think that condition could ordinarily occur in a domestic refrigerator.

C. Q. 15. I wish to call your attention to the Fisher patent, No. 133,147, and ask you if such patent does not show a construction which allows a very clear and unobstructed passage of the air from the provision chamber to the ice-chamber, and from the ice-chamber to the provision chamber.

A. The Fisher patent is, in my opinion, much better than some others that have been referred to. One of its defects is, however, that which I pointed out with reference to the Sanford patent. The air is conducted to the roof of the chamber, entirely above the ice, and is obliged to descend again before it impinges upon the ice. The ice rests upon a flat form over which the cold air flows, side ducts which permit it to flow down into the provision chamber. Two years ago I built a large-sized cold-closet for my own use, in which the air ducts were arranged very similar to those of the Fisher patent, but did not find its operation satisfactory.

C. Q. 16. Does or does not the ice-table in the Fisher patent retard the free circulation of the air from the ice-chamber to the provision chamber?

A. The ice-table would retard the free circulation of the air, not to a material extent, perhaps, but the partition forming the uptake flue, continuing nearly to the roof of the chamber, and above the ice, would retard.

C. Q. 17. Is it a fact that the larger the flues for the cold air and warm air in the refrigerator, everything else being equal, the more rapid would be the air currents?

A. As a general proposition, I have no doubt it is a fact, but in practice there are limitations.

318 C. Q. 18. In an ordinary family refrigerator, can the temperature in the provision chamber be maintained at a point below 50, or thereabouts?

A. I have no definite information as to that, but I should think if the chambers remained closed for a considerable length of time the temperature of the lower chamber would become more nearly the temperature of the ice than indicated in the question.

C. Q. 19. What must be the difference in temperature between

the air in the ice-chamber and the air in the provision chamber in order to insure even the slightest circulation?

A. That would depend upon the obstructive resistance due to the structure of the refrigerator. Theoretically, and without considering friction, any difference of temperature would cause circulation.

C. Q. 20. The question was intended to call for practical facts and not theory, and I would like to have you answer the question upon that basis. (Last question repeated.)

A. It is impossible for me to give any more precise answers to the question, because differences in temperature to produce circulation in a refrigerator made according to the Hambrook patent would not produce an equal circulation, if any, in refrigerators constructed according to other patents referred to.

C. Q. 21. Referring, then, to the structure described and shown in the Hambrook patent, what difference in temperature between the ice-chamber and the provision chamber would, in your opinion, be necessary in order to give a practical circulation to the air within the refrigerator?

A. The only answer I can make to that question is that in
319 the refrigerating chamber which I constructed and alluded to in a previous answer, the thermometer in the provision chamber indicated a temperature of about forty-five, after the door had been closed for a considerable time and a refrigerator which was made by complainant company which I have in use, gives us better satisfaction as to temperature than the refrigerating chamber which I built.

C. Q. 22. In the refrigerating chamber which you built, did you make any test with the thermometer in the ice-chamber itself?

A. I did not.

C. Q. 23. In the refrigerating chamber built by you, what was the size of the ice-chamber and what was the size of the provision chamber?

A. The provision chamber was about four feet by seven on the floor, about seven feet high, and the ice-chamber was about four feet square on the bottom and about three feet high. These dimensions I give entirely from memory and they are only approximations.

C. Q. 24. Does the air increase its capacity for holding water in the same proportion as it is increased in temperature?

A. The capacity of air for holding water increases with temperature; the ratio I do not remember.

C. Q. 25. Supposing two equal bodies of air of different temperatures, each saturated with water to its full extent, were mingled together, not violently, would such combined body of air necessarily deposit any moisture?

A. No.

C. Q. 26. If a body of warm air is brought in contact with a cold body or with a body many degrees colder than itself, would it necessarily deposit moisture upon the cold surface?

A. It would.

320 C. Q. 27. Do you consider the Sanford refrigerator, as de-

scribed and shown in the specifications of the Sanford patent, a practical refrigerator?

A. I do.

C. Q. 28. Does not the Sanford refrigerator provide for a very free and unobstructed circulation of the air current, aside from the interposing shelves?

A. Referring to the reissue drawings, the circulation would be much freer in the refrigerator constructed in accordance therewith, than in one constructed in accordance with the drawings of the original patent, but there is in the Sanford patent, a very serious defect which was not noticed by me in my answer to question 5, and that is, in order to produce circulation, the whole body of air, which passes downward from the ice, is compelled to descend to the floor of the provision chamber before it can pass into the uptake portion of the refrigerator. This would under all circumstances, impede circulation, and if warm substances were placed in the compartment beneath the ice, it would defeat it almost, if not entirely.

C. Q. 29. Is it not a fact that an obstruction in any part of the circulating air current, equally affects the circulation in all its parts?

A. I don't think that would follow as broadly as the statement of the question.

C. Q. 30. If not, please give the reason why not.

A. Well, because an obstruction in a certain line of the circulation might act simply to deflect the current, without making any material difference in the whole circulation.

C. Q. 31. Can you deflect an air current without adding an obstacle to the free movement of the current?

321 A. No, but that was not the purport of your question.

C. Q. 32. Do you mean that an obstacle in any portion of the air current will affect the air current in all its parts?

A. No, I mean that an obstacle in an air current will affect the air current in that part, as for instance, in the Hambrook patent; supposing the partition *a* to be absent, an obstacle placed upon the left-hand side would be an obstruction to the air then in circulation on that side, but not to the circulation to the other side.

C. Q. 33. What effect upon the refrigerator shown in the Hambrook specification, has the partition *a* on the air currents?

A. I do not think it has any material effect upon the air currents.

C. Q. 34. Does it not have the effect to entirely separate the downflowing air current on one side of such partition from the downflowing air current on the other side of said partition?

A. Yes, but I think it has no effect upon the volume or velocity of the circulation.

C. Q. 35. Would not the air move more freely downward through an open space than it would in contact with the partition?

A. The vertical partition, to which I suppose you refer, undoubtedly adds a little frictional resistance to the motion of the air.

C. Q. 36. Does not the cold air immediately on entering the pro-

vision chamber from the ice-chamber, fall to the bottom of the provision chamber?

A. Not necessarily. It will continue to fall until it absorbed heat from something so as to be expanded.

322 C. Q. 37. Does the expansion of the air have a tendency to raise its temperature, or in other words, to make it warmer?

A. A rise in temperature has the effect of expanding the air.

C. Q. 38. You misunderstood the purport of my question, which was, does the expansion of the air have a tendency to raise its temperature?

A. The expansion of air due to its flow into a partial vacuum, has an effect to lower the temperature, but I do not understand how that effect could take place in a refrigerator of this sort.

C. Q. 39. Supposing the partition *a*, or so much thereof as projects below the inclined bottom pieces of the Hambrook refrigerator, was entirely removed and the provision chamber filled, as a refrigerator is ordinarily filled with provisions in use, would not the two descending air currents, mingle together so that one would be entirely lost with the other?

A. I presume they would.

C. Q. 40. In a -frigerator constructed as proposed in the last question, would not the downward flow of air be facilitated by the removal of the upper portion of the partition, so that the air would flow downward through a single opening?

A. To the extent that the partition *a* offers frictional resistance to the passage of the air through the opening of the inclined bottom, that would be true broadly, but inasmuch as the Hambrook patent contemplates the extension of the partition throughout its entire height so as to constitute two refrigerators within one case, as well as the entire removal of the partition, indicated by the use of the provision chamber in the singular number, I do not think it

323 would be fair to say that the removal of a portion of such chamber constituted an improvement over what was contemplated by the patentee.

C. Q. 41. Does the air in the refrigerator flow in substantially the same way as water would flow if similarly situated?

A. Yes, all fluids flow in the line of least resistance.

C. Q. 42. The time that it would take for the air in the refrigerator to make a circuit, would be the time that it would take it to pass through the smallest or narrowest opening?

A. I do not think the question is quite in right form, but I will say, yes.

And thereupon a recess was had until 2 o'clock.

C. Q. 43. What effect, or to what extent does the moisture in the atmosphere increase in specific gravity?

A. I don't know.

C. Q. 44. Is it not possible that the moisture which the air receives from the ice may have a tendency to increase the circulation, in a refrigerator after the temperature of the refrigerator has become nearly uniform?

A. I never made any experiments about it, but the theory, as I have always understood it and the statement of these patents is to the effect that the air does not receive any moisture from the ice.

C. Q. 45. Is it not a fact that the statements found in the specifications of patents and the theories for working the machines are often erroneous, and that they seldom can be relied upon?

A. That is a fact, but in this case the statements are in accordance with the general facts, that air coming in contact with a cold body will prevent such moisture.

324 C. Q. 46. How great must be the difference in temperature between the surface of the cold body and the warmer air coming in contact therewith, in order to have condensation of moisture?

A. Any reduction in temperature will cause a precipitation of moisture, the principle being, as I understand it, that a reduction of temperature reduces the capacity of air to hold water in suspension, not that a slight reduction in temperature would ever cause complete precipitation.

C. Q. 47. What do you mean by incomplete precipitation?

A. By complete precipitation, I mean the giving up of all its moisture. Anything less than that would be incomplete, and I do not know at what temperature complete precipitation would take place.

C. Q. 48. Then, if I understand you correctly, incomplete precipitation will be no precipitation at all. Is that your meaning?

A. That is not the meaning of the words that I used, and I do not think it is a fair understanding of them.

C. Q. 49. Will you then define clearly, what you do mean by incomplete precipitation, and also explain by what means you can determine when incomplete precipitation takes place?

A. I will repeat my answer to the 46th question, which contains a complete definition, to wit: any reduction in temperature will cause a precipitation of moisture, the principle being, as I understand it, that a reduction of tempera-ure reduces the capacity of air to hold water in suspension, not that a slight reduction of temperature would ever cause complete precipitation, and I afterwards said that I mean by complete precipitation, the precipitation of all its moisture, and that I do not know at what temperature com-

325 plete precipitation would take place. With reference to the last clause of your last question, I will say that we may feel very certain that complete precipitation never takes place within a domestic refrigerator cooled with ice. There are various ways of ascertaining that air holds moisture in suspersion.

C. Q. 50. Taking your definition for complete precipitation of the water from the air, is it not absolutely impossible, so far as human science can ascertain, that there ever can be complete precipitation?

A. I am unable to answer that, and I am not sufficiently acquainted with the resources of science in that direction, but I suppose that it is not impossible to remove all the moisture from the air.

C. Q. 51. Will you please to state what chemical elements enter into the composition of air and what chemical elements enter into the composition of water?

A. Atmospheric air is composed of oxygen and nitrogen, with various impurities always present. Water is composed of oxygen and hydrogen, but the proportions I am not able at this moment to state.

C. Q. 52. If a body of cold air is mingled with a body of warmer air, would it necessarily produce precipitation or moisture?

A. I have answered that question once before. I don't think it would.

C. Q. 53. Will you explain why, that the current of warm air with a cold substance, will necessarily produce condensation, while the contact of cold air with warm air will not necessarily produce precipitation?

A. Circumstances of the cases are not parallel. In the contact of cold and warm air, the capacity for holding moisture would be increased by an increase of its temperature, while the capacity
326 for holding moisture of the warm air would be diminished, the resulting temperature being demeaned between the two, but I think the result in capacity would remain the same. I will say that I never made any experiments as to that, nor do I remember ever having read anything in regard to it. I give it simply as an opinion given upon the moment.

C. Q. 54. You have carefully studied these various patents, have you not?

A. I have not. I have carefully studied the drawings to ascertain the construction, and I have read the specifications.

C. Q. 55. Is it not a fact that after a careful examination of the specifications and drawings of the several patents which were offered in evidence on the part of the defendant, that you formulated the answer to interrogatory No. 5, propounded by Mr. Brown; that you wrote the same out at length and that the same was copied as your testimony?

A. Yes. It is not a fact that I carefully studied, or had any occasion to study the several specifications of the patents referred to.

C. Q. 56. How long before to-day was answer No. 5 written out by you?

A. It was written out on Sunday last (16th).

C. Q. 57. Does the shape of the opening from the ice-chamber to the provision chamber of the refrigerator have any effect upon the free downward movement of the cold-air current?

A. Well, I should think not much, but inasmuch as the ice-chamber and the lumps of ice are usually rectangular, a rectangular prolongated opening would be preferable, perhaps, as affording shorter lines of travel for the air currents descending from the ice.

327 C. Q. 58. Supposing the opening was very long and crooked, and the area of the open space was the same as in a straight rectangular opening. Would the air pass as freely through the long and crooked opening as through the straight rectangular opening?

A. I cannot answer that question. It would depend upon conditions not stated in the question.

C. Q. 59. Which do you understand to be the best conductor of heat, water or atmospheric air?

A. Well, I don't know at this moment. Atmospheric air permits radiant heat to pass with very slight resistance, water not so much so, but whether air will absolve and transmit with greater facility than will water, I do not at present know.

C. Q. 60. Returning now to the Sanford patent, is it not a fact that the air from the ice-chamber moves directly and practically in straight lines into the provision chamber?

A. It is so indicated by the arrows placed upon the drawings by the draughtsman, but I do not consider it as at all reliable.

C. Q. 61. If such be the fact, however, would not the air pass more freely from the ice-chamber in the Sanford invention to the provision chamber, that it would in the Hambrook invention?

A. No, because no fluid can pass through a number of small openings with the same freedom as th-ough one large opening of equal area.

C. Q. 62. How much faster will a body of air pass through an opening, say, two inches square in cross-section, than it would pass through two openings, square in cross-section having the same area as the large opening?

A. I don't know. I can't carry in my head everything I ever read.

328 C. Q. 63. Is this retarding of the motion of the air in passing through these small openings, caused entirely by the friction of the air currents, with the inner surfaces or what might be termed the internal periphery of the opening?

A. The discharge of fluid through orifices is a good deal mixed and uncertain, but I can say in answer to the question that a portion of the resistance to the passage of any fluid through any orifice is internal as to the current itself.

C. Q. 64. Which in your opinion, will have the greater tendency to retard the free movement of the air, the dividing of the opening into various small openings, or the lengthening and bending of the flue or conduit which conveys the air current?

A. I can't answer that question. It depends upon the length of the flue and the number and abruptness of the bends, as well as the number of the small openings.

C. Q. 65. In which construction, the one shown by the Sanford patent or the one shown by the Smith patent, would the air move most freely?

A. I don't know. Sanford has obstructions, which Smith does not have, and Smith has obstructions which Sanford does not have. Which would be the most serious I cannot say. Both of them are bad enough.

C. Q. 66. In the Hambrook patent, if the small projections or guards *c c* were removed, would not the air pass more freely into the ice-chamber than it would in the construction shown in the patent?

A. I don't think it would, because it would not then be directed to impinge upon the sides of the ice, which alone determines the power of the ice to cause the desired circulation.

329 C. Q. 67. How large do you think the warm-air opening should be in a refrigerator, in order to produce the best results, say in a refrigerator of the ordinary medium size?

A. All I can say to that is that I think the warm-air openings ought to exceed in size the cold-air openings, for the reason that warm air is larger in volume than cold air, because I believe that active circulation in a refrigerator is preferable to a retarded circulation and greater refrigeration of the air.

C. Q. 68. Will you now refer to the Lyman patent and point out the obstacles therein contained, which prevent the free circulation of the air?

A. I have already pointed out in the Lyman refrigerator, that it is defective in conducting the cold air to the bottom of the refrigerator, requiring it to rise up and around any substances which are placed in it to be cooled. What I mean by that is that the cold air having reached the bottom of the refrigerator, will tend to remain there until expanded by heat acquired from some source, and this tendency to remain at the bottom of the chamber would constitute an impediment to the circulation.

C. Q. 69. Aside from the impediment which you refer to, is not the Lyman structure admirably adapted to a free and rapid circulation of the air?

A. Well, I think if from the Lyman refrigerator, the duct which he designates by the letter F, were removed, and which I understand by your question to be contemplated in the words "aside from the impediment," I think it would be very well adapted, and almost equal to the Hambrook device. It would be quite equal to it if said duct were removed, and a warm-air opening into the ice-chamber was also removed further from the roof.

330 C. Q. 70. If the Lyman patent antedated the Sanford patent, would it not be a practical anticipation of everything claimed in the Sanford patent?

A. I think so, and I think it would be a better thing than the Sanford.

C. Q. 71. Does not the warm air in the Lyman patent open directly upon the ice, as it does in the Hambrook patent, so far as can be seen from the drawings of the two patents?

A. Not entirely, because in the drawings of the Lyman patent, said opening is at the highest possible point, whereas in the Hambrook patent, it is some distance below the highest point, and is placed there for the purpose which Lyman did not have.

C. Q. 72. Do you know how far below the top of the ice-chamber the deflectors *e e* are actually placed in a refrigerator, as constructed by complainant?

A. I don't remember.

C. Q. 73. Do you find any place in the specifications of the Hambrook patent which indicates that the partition *a* may be dispensed with?

A. Yes; in the second paragraph of the specification it is said, "cold air, generated by the melting of the ice, will descend in a dry state to the provision chamber." At the close of the long paragraph column 2, page 1, reference is made to the provision chamber. The second paragraph, column 2, page 2, reference is made to the provision chamber twice. The provision chamber is also mentioned in the claim. This is inconsistent with the presence of the partition, which is necessary to constitute the two chambers, also spoken of in the specification. Also in the third paragraph, page 2, it is provided
331 that the partition *a* may be extended to the top of the ice-chamber, the effect of which would be to constitute two refrigerators within the same case, each having one ice-chamber and one provision chamber.

C. Q. 74. In case this partition was extended so as to make two complete refrigerators, would each refrigerator represent the invention described and claimed in the Hambrook patent?

A. I do not think that an expert ought to answer that question, for the reason that the claim, in its terms, appears to be somewhat confused in this particular. A combination is made with provision chambers with the side passage *c* from the provision chamber. There is no doubt in my own mind about a fair construction of the claim, but it seems to me to be a question for the court.

C. Q. 75. In your answer to direct question 5, which answer was so carefully considered by you that you wrote it out in full in advance of your examination before the notary, you express yourself very freely as to the construction of the Hambrook patent. Why do you now hesitate in expressing your opinion about the Hambrook construction, on your cross-examination?

A. In answer to the question I will say that the answer to question 5 was written out in advance solely for the purpose of saving time for myself in Chicago and incidentally to save expense to your client, and I do not remember that I said anything whatever concerning the legal construction of Hambrook's claim. I have no hesitation now in saying what my opinion is, if you think it would be of any value.

C. Q. 76. Do you consider the projections *c c* as necessary elements of the Hambrook invention?

A. They are not mentioned in the claim and are only nec-
332 essary so far as it is required that the ascending air current shall be directed to impinge upon the ice and the projections *c c* are shown as the means for effecting that object.

C. Q. 77. Would a person avoid an infringement of the Hambrook patent by merely leaving off the projections *c c*?

A. No, he would not. It is easy to conceive of a construction which technically would omit the projections *c c* without changing the operation in any particular.

C. Q. 78. Does not the description in the Hambrook patent show that Mr. Hambrook at first attached no particular importance to these projections?

A. The specification of the Hambrook patent shows that he did attach importance to the results effected by these projections.

C. Q. 79. If, instead of the projections *e e*, Hambrook had extended the inner walls of the outer air flues *c c* up to the lid of the refrigerator, and then had cut lateral openings in the position shown by the arrows passing into the cold-air chamber, would the result or operation of the refrigerator differ in any way from the result or operation of the structure shown in the drawings?

A. Yes, it would have differed in this particular, as in the construction shown in the Hambrook patent the currents are given a slightly downward direction, which they would not have if it simply flowed through an opening in the partition.

C. Q. 80. Do you think that the course of the air current in the air passage *c* has sufficient velocity to be deflected downward to any perceptible extent by the slight inclination of the lower surface of the projection *e*?

333 A. Well, I presume it would at times when circulation is active, but, of course, I cannot say to what extent.

C. Q. 81. If it be true that the downward inclination of the projections *e e*, would give a downward deflection to the air currents, how could the air impinge upon the upper central portion of the ice which practically fills the ice-chamber, as shown in the Hambrook patent?

A. The Hambrook specifications does not say anything about impinging upon the upper central portion of the ice, but that it will impinge upon the top, bottom and sides, and I do not understand from the specification that it is necessary for the air currents to impinge upon the top, bottom and sides of the ice all at the same time and all the time.

C. Q. 82. Is it not a fact that this deflecting of the air current by the projections *e e*, is simply nonsense, and that the only function of these projections is to prevent small particles of ice from dropping into the provision chamber, as stated by Mr. Hambrook in his specification, and is it not a further fact that Hambrook in no place refers to any such deflection of the air current, caused by such projections?

A. It may be all nonsense, but I am not in the habit of testifying to what I think is nonsense, and it is probably true that in the Hambrook specification the function of the projections *e e*, mentioned, is that of guarding the falling of ice or other substances into the provision chamber, but that does not affect, in any way, the necessity that I am under of taking account of the fact that the specification clearly indicates an intention and means for directing the air currents so that they will impinge upon the ice, and that the means shown in his drawings are the projections *e, e*. Whether they would have more or less effect in directing the air currents

334 towards the ice, would depend upon the velocity of those currents in the uptake *c*, and it is clear to my mind if there was any movement whatever, it would be directed.

C. Q. 83. It is also clear to your mind, is it not, that because Mr. Hambrook refers in the singular to the provision chamber, that he did not consider the partition *a*, a material part of his invention?

A. It is in my mind that he did not consider the partition *a* as

necessary to that part of his invention which referred to the circulation of air, and which constituted the material part of his invention.

C. Q. 84. You derive your conclusion, do you not, from the fact that Hambrook, in his specification, refers to the provision chamber in the singular?

A. I derive my conclusion from the fact that he refers repeatedly to the provision chamber in the singular, and also in a separate way to a construction which would require a provision chamber to be in the singular.

C. Q. 85. In the construction referred to in your last answer, Mr. Hambrook would have but a single air passage and a single trough, *z*, would he not?

A. That is all that is shown in his drawing.

C. Q. 86. Is it not possible that Mr. Hambrook considered the entire portion of the refrigerator below the ice-chamber as constituting a single provision chamber, even when it was divided by the partition *a*?

A. That is possible. I do not know what he considered.

C. Q. 87. In Mr. Hambrook's specification he states as follows: "The provision chambers are separated from each other by the perpendicular partition *a*, which is composed of wood, sheet metal, or other suitable substance, and extends from front to rear of the provision chamber and from the bottom thereof into the ice-chamber, as hereinafter described." Does not Mr. Hambrook here distinctly refer to this chamber in the singular, notwithstanding that he certainly describes it as being entirely separated by the partition *a*?

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A. He does; and I said in the beginning of this cross-examination that I did not consider the Hambrook specification to be skillfully drawn.

C. Q. 88. If the partition *a* were extended, as described in the third paragraph of the second page of the Hambrook specification, so as to completely divide the refrigerator into two parts, would not one part work perfectly as a complete refrigerator, containing all the functions of the Hambrook invention, entirely independent of the other part?

A. Not exactly. Two parts would work perfectly at the same time as two refrigerators. Neither would work so well alone.

C. Q. 89. What would prevent each part working as well alone as when united?

A. It would lack a heat-insulating wall on one side.

C. Q. 90. With the addition of such heat-insulating wall would not, then, such half of a refrigerator work as well alone and be perfect in all its parts, having all the functions and the same operation as the Hambrook invention?

A. I have no doubt of it.

C. Q. 91. Do you then consider that two side passages, indicated by *c* in the Hambrook invention, are essential to the full operation of the Hambrook invention?

A. I do not think he is limited as to the number of side passages.

C. Q. 92. Do you think he is limited as to the number of troughs for conveying water to the waste pipe?

336 A. Technically, no.

C. Q. 93. Do you think that he is limited to the number of bottom pieces to the ice-chamber?

A.. I do not, because I cannot conceive an invention and a patent could be avoided by merely subdividing such a thing as the bottom of an ice-chamber.

C. Q. 94. Just what do you understand Mr. Hambrook invented that was not new or known prior to the said invention?

A. I have answered that question very fully in my direct, and it is very well expressed in the second paragraph of his specification wherein he describes the air current generated by the melting of the ice, as flowing "without material hindrance." Comparing Hambrook's invention with those patents referred to in anticipation, it appeared to me that he was the first to realize the fact that the air currents in the refrigerator would always be feeble, and that in order to get the desired results, it was necessary to avoid hindrance. I consider that so far as this comparison has taken me, he has exhibited the greatest amount of intelligence in the organization of his means for that end.

C. Q. 95. Referring now to the patent issued to A. J. Chase, dated October 5, 1869, I ask you if you do not find an inclined bottom to the ice-chamber having a lining upturned so as to form a trough in almost the exact similitude of one of the inclined bottom pieces of the Hambrook invention?

A. Yes, and substantially the same thing as in the Lyman patent also.

C. Q. 96. You do not see a difference in the construction of the trough in the Chase patent and in the Lyman patent?

337 A. There is a difference, but not material.

C. Q. 97. In the Chase patent referred to, do you not find a construction which allows the cold air to pass out freely from the ice-chamber into the provision chamber, as you find in the Hambrook patent?

A. Yes, but it will not get back as freely.

C. Q. 98. I am not referring to its getting back, but referring to the construction which allows it to descend, and I will carry my question further, by asking you if the ice-chamber, the ice-rack, the inclined bottom piece, the trough and the opening from the ice-chamber into the provision chamber in the Chase invention, are not full equivalents to the corresponding parts shown and described in the Hambrook patent?

A. Yes, but the refrigerator is a different one.

C. Q. 99. Supposing, in the Chase patent, the warm-air flue was increased in size so as to allow the warm air to rise readily, would not such refrigerator then have practically all the functions of the Hambrook refrigerator?

A. No; no increase of size would cause the air to descend from the ice as freely as it would flow upon the ice in a lateral direction.

C. Q. 100. In your opinion, would a refrigerator constructed in accordance with the Chase patent, be a practical refrigerator?

A. Any box with non-conducting sides and a lump of ice inside of it, would be a practical refrigerator to a certain degree, and so would Chase's refrigerator, but it would not be so good and practical as a refrigerator made in the Hambrook form.

C. Q. 101. How much more rapidly do you think the air would circulate in the Hambrook refrigerator than in the Chase refrigerator?

338 A. I do not know, but I have no doubt, however, that air would circulate in the Hambrook refrigerator under conditions which would prevent circulation in the Chase refrigerator.

C. Q. 102. Would not the air in the Chase refrigerator pass from the ice to the provision chamber in an invariably cold, dry condition?

A. I presume it would.

C. Q. 103. I now call your attention to the patent issued to E. A. Banta, January 1, 1867, and ask you if such patent does not contain, substantially, the double-inclined bottom pieces of the Hambrook refrigerator?

A. It contains double-inclined bottom pieces, but they are not those of the Hambrook refrigerator.

C. Q. 104. In the Banta patent referred to, would not the air pass in a cold, dry state, or comparatively so, from the ice-chamber into the provision chamber?

A. I do not understand that in the Banta patent, the circulating air has access to the ice, except at the bottom of it, and I should not expect with that construction that the air would be deprived of its moisture to any considerable extent.

C. Q. 105. Would not such air be deprived of its warmth, so that it would pass in a cool state into the provision chamber?

A. In the Banta patent, it seems to be contemplated that the air warmed by the substances in the lower chambers will rise through certain ducts and escape to the open air, although there is also provision that a portion of it may rise through a smaller duct and descend again along the outer side of the ice-chamber flowing underneath the ice over the inclined bottom back into the provision chamber. It would be cooled to some extent by passing in

339 the vicinity of the ice, but it does not appear to me that the refrigeration and condensation would be comparable to what takes place when the air passes over the ice, as in the Hambrook refrigerator.

And thereupon an adjournment was had until Wednesday, February 19, 1890, at 9 o'clock in the forenoon.

P. H. T. MASON,
Notary Public.

FEBRUARY 19, 1890—9 o'clock a. m.

Met pursuant to adjournment.
Present, as before.

C. Q. 106. Referring to the Chase patent 95428, does not the specification provide for a modified construction which would give the warm-air flue a more direct course from the provision chamber to the ice-chamber?

A. In answer to that I will say that the upper portion of the refrigerator may be of the same size as the lower part of the provision chamber, but it does not follow from that that the warm air would have a more direct course.

C. Q. 107. If the ice-chamber and provision chamber were of the same size, would it not save the lower turn in the warm-air duct from the provision chamber to the ice-chamber?

A. It would save one of the lower turns, but if he had had any just appreciation of the conditions of air currents in the refrigerator, he would have saved both of those lower turns in the refrigerator as he shows it.

C. Q. 108. Suppose Mr. Chase had opened his air flue directly downward in the provision chamber at the bottom of said air flue and at the top had deflected or opened said air flue laterally into the ice-chamber, would he not then have had substantially the Hambrook construction?

340 A. Yes, provided he had also made his air ducts of adequate size.

C. Q. 109. In the Hambrook patent and also in nearly all the patents issued since the Sanford patent, does not the descending cold air, produce whatever circulation is found in a refrigerator, or in other words is Hambrook correct when he states, "that the continuous body of cold air, generated by the melting of the ice will descend in a dry state to the provision chamber without material hindrance, causing the displaced and less frigid air to descend," etc.?

A. Hambrook is correct and the assumptions of the question are correct as to the intention of Sanford and those other inventors of refrigerators referred to. It is an ordinary way of expressing the general fact that cold air is heavier than warm air and will displace it.

C. Q. 110. Referring now to the Hambrook patent as shown in figure 2 of the drawing, if we suppose the air in the refrigerator is in a state of equilibrium throughout, and you should place a piece of ice upon the ice-rack as therein shown, what would be the first effect upon the air?

A. Supposing the air to be originally warmer than the ice, the first effect would be to cool that air which was adjacent to the ice.

C. Q. 111. What effect would this cooling of the air next to the ice have upon the motion of the air?

A. The effect would be to produce a tendency to downward movement.

C. Q. 112. The movement then in the refrigerator is really caused

by the specific gravity or greater specific gravity of the cold air than of the warm air, is it not?

A. That is what I have said several times, I believe.

341 C. Q. 113. Supposing the warm-air opening, instead of opening into the provision chamber, as shown in the Hambrook invention, opened into the outside air. What effect then would the cooling of the ice in the ice-chamber have upon the air at these openings?

A. Well, the effect would be to greatly enfeeble the already feeble currents of circulation, because the cooled air if it escapes from the ice-chamber, must necessarily be replaced by air entering the ice-chamber, and if the escaping and entering currents are compelled to pass through the same opening, they would simply obstruct each other.

C. Q. 114. Supposing you should close up the side passages, *c c* altogether, and allow the cold air to escape at the bottom of the provision chamber, and then cause the openings, *c c*, to open directly into the outer air. What would then be the motion of the air currents?

A. You would then have provided simply for a passage of air through the refrigerator, and no such structure as this is shown, and if it were provided in a structure for a refrigerator, it would be constantly interfered with by any warm substances placed within the provision chamber which would tend to set up local currents of circulation.

C. Q. 115. Would not the cold air flow freely out at the bottom of the provision chamber so long as the atmosphere in the provision chamber should be cooler than the outside air?

A. Undoubtedly.

C. Q. 116. Do you not know that refrigerators, refrigerating cars, etc., for preserving food, and for cooling and ventilating rooms, are constructed and are now used, wherein the air is taken in from the outside of the structure, carried through and discharged into the open air, substantially in the manner suggested in my questions?

342 A. I do not dispute any statement just now made, regarding the construction of refrigerator cars, or the ventilation and cooling of rooms, but I do not see any connection therewith of anything to which my attention has been called in this case, nor does it modify my opinions or statements which I have made.

C. Q. 117. In case the outside atmosphere were considerably warmer than the atmosphere within the provision chamber of a refrigerator, would not a refrigerator constructed with an opening from the outer air, into the ice-chamber, and from the bottom of the provision chamber to the outer air, give a much stronger air current than could be produced in a closed refrigerator like the Hambrook, where the differences in temperature between the air in the provision chamber and the air in the ice-chamber must necessarily be comparatively small.

A. I have no doubt as to that, nor that the expense would be proportionately greater.

C. Q. 118. The expense would be caused by the wasting of the ice, would it not?

A. Yes.

C. Q. 119. In your opinion, in order to produce the best results in a closed refrigerator, at what point should the warm air be introduced into the ice-chamber?

A. I think the lateral introduction of the Hambrook invention opposite the ice, is the most perfect I know.

C. Q. 120. Would you introduce the air at a point about on a level with the top of the ice?

A. Well, I should say so, as that would give the most immediate and longest contact of the ice.

C. Q. 121. I now call your attention to the Rohrer patent, December 12, 1871, and ask you if such patent does not show a
343 devise which would afford very free movement for the upper warm-air current from the provision chamber to the ice-chamber?

A. Yes, but his bad construction elsewhere nullifies that.

C. Q. 122. Does not the Rohrer patent show a construction which allows the cold air to descend freely from the ice-chamber to the provision chamber?

A. In the construction shown, the Rohrer patent does not permit the cold air to descend to the ice-chamber without hindrance, the construction of the bottom beneath the ice-rack being such that it would only flow through narrow and tortuous passages.

C. Q. 123. Does not the construction of the Rohrer invention show a much larger space in the aggregate for the downflow of air than is found in the Hambrook construction?

A. I have no means of knowing as to that. The aggregate of the spaces would necessarily be very much larger in order to be equivalent to the Hambrook.

C. Q. 124. I now call your attention to figure 4 of the Rohrer patent and ask you if the air would not pass freely down between the several deflecting plates therein shown?

A. The freedom with which the air would pass between deflecting plates would be limited only by the distance between them.

C. Q. 125. Will you point out by reference to figure 4 of the Rohrer specification, the construction which causes the great obstruction to the downflow of the cold-air current?

A. Well, in figure 4 of the drawing, there is represented a transverse section of the bottom beneath the ice-rack. It is com-
344 posed of deflecting plates which are inverted troughs, designated by the letter R, and beneath the space between said deflecting plates there is a series of troughs designated by the letter R′. Currents of air descending between the deflecting plates will be arrested by the troughs, and compelled to change direction to flow over the edges of the troughs down into the chamber below. This is a hindrance to the flow.

C. Q. 126. If these troughs R′ were removed, would not the air then flow freely into the provision chamber from the ice-chamber?

A. They would flow much more freely.

C. Q. 127. Supposing the opening between two of the deflecting plates were as large as the opening in the bottom of the ice-chamber of the Hambrook patent, and the trough was removed, would not the air flow as freely through such opening, or even more freely through such opening than it will flow through the divided opening in the Hambrook invention?

A. Possibly it would. I have no doubt the Rohrer invention could be greatly improved.

C. Q. 128. Does not the cooling of the ice in the ice-chamber, or in any chamber, have a tendency to produce a partial vacuum at the top of such chamber?

A. No, I don't think so.

C. Q. 129. Will you please explain then, why, that a quantity of ice placed in a room, having an opening at the top to the open air, as well as an opening in the bottom of the chamber to the open air, will cause a continuous downflow of air to the chamber, as long as the temperature in the chamber is lower than the temperature outside of the chamber?

A. A ventilating fan operated in either opening would produce the same result, but, to speak of it as a partial vacuum is, in my estimation, too much refinement.

345 C. Q. 130. Will you please to explain in the example I supposed, what causes the continuous downward current through the ice-chamber?

A. I understand what you mean perfectly well. You simply object to the refinement of expression. It is not what is ordinarily referred to as a vacuum, or partial vacuum. It is generally understood to indicate a partial exhaustion of the atmospheric air, a thing which would not take place under the circumstances named.

C. Q. 131. If the question calls for terms of too great refinement, I will ask you if the descent of the atmosphere, cooled by the ice, will not continually suck in the air at the top of the ice-chamber, and as such air becomes cooled, it will flow out by its own gravity at the bottom of the ice-chamber?

A. The terms used are not recognized as proper, but I will not dispute the fact. They do not imply any vacuum or partial vacuum.

C. Q. 132. Will you point out the principal obstacle found in the Law patent which will retard the downward flow of the cold air?

A. The principal obstacle is the trough F, the sides of which rise and overlap the depending flanges of the opening E.

C. Q. 133. Is there anything in the Law specification which indicates that the sides of the troughs should lap by the bottom pieces?

A. No, and there is nothing which indicates that it need not lap by. If it did not lap by, it would simply be slightly less an obstruction.

C. Q. 134. Supposing in the Law patent, the perpendicular side pieces of the trough F were removed entirely and the trough
346 down so as to allow large openings between it and the bottom pieces, would not the air then pass freely down into the provision chamber?

A. I cannot conceive of the Law refrigerator being made without the trough below and wider than the opening above it and wherever it should be placed at the top of the provision chamber so as to serve its purpose, it would be an obstruction for the downward flow and in that respect different from the Hambrook patent.

C. Q. 135. The amount of water carried by the trough at one time is very small, is it not?

A. Well, that would depend upon the size of the structure. It would not be a very large amount.

C. Q. 136. If the trough F was made with a flat bottom and had its edges turned up a quarter of an inch, it would have a capacity, would it not, to convey all the water from the melting of the ice, in an ordinary household refrigerator?

A. I presume it would, but that is not the way it is shown and described.

C. Q. 137. Do you think it would require an invention for a mechanic to reduce the proportions of the trough F to the size indicated in my last question?

A. I think it would require invention to find out the desirability of doing that. A mechanic can make any invention or any modification of any invention after he knows a reason for doing so.

(Question objected to as incompetent.)

C. Q. 138. Do you think the invention of Hambrook consisted in his discovering that it was desirable to have a free movement of the cold-air current, and that such free movement would be attained by the removal of obstructions, such as were shown in prior patents, where the air was compelled to rise over the trough, as shown in the Law patent?

347 A. That is in substantial accordance with the views which I have stated.

C. Q. 139. I now call your attention to the Hunt patent No. 4789, and ask you what obstacles you find in such patent to the free downward flow of the cold air to the ice-chamber.

A. The obstacles are the same in kind as those of the Rohrer and Law patents. The openings in the bottom below the ice-rack have upturned edges, which are covered by inverted troughs.

C. Q. 140. What is the function of the inverted trough in the Hunt patent?

A. To prevent drip-water from flowing into the provision chamber.

C. Q. 141. Does this inverted trough have the same function in the Hunt patent as the deflector plate in the Hambrook patent?

A. So far as the prevention of drip-water is concerned it has the same function, but its structure and location also obstructs the flow of air, which it does not do in the Hambrook patent.

C. Q. 142. Will you please explain why the deflector or inverted trough in the Hunt patent interferes with the flow of the air and that such deflector plate would not obstruct the flow of air in the Hambrook patent?

A. In the Hunt patent the flow of air is obstructed because of

the edges of the inverted trough and the upturned flanges around the opening overlap each other so that the air cannot pass without rising over the flanges. This is not the case with the Hambrook patent.

C. Q. 143. The obstruction, then, in the Hunt patent is principally in the trough, is it not?

A. It is in the conjunction of the troughs and the flanges.

348 C. Q. 144. If the troughs in the Hunt patent were removed would the deflector still interfere with the free movement of the air?

A. Not to any material extent; but it would not then be Hunt's patent.

C. Q. 145. Does not the warm air open into the ice-chamber in the Hunt patent at about the right distance from the top of the ice-chamber, to produce the best results?

A. I think not. I think the openings into the ice-chamber for the warm air are too high up, too small, and without any provision for direction of the currents, and go to show that Hunt did not understand the conditions of the problem he was trying to deal with.

C. Q. 146. You judge of the size of the openings for the admission of the warm air into the ice-chamber entirely from the drawings, do you not?

A. I have nothing else except the certified model here to judge by, and they appear to be in accordance.

C. Q. 147. Referring to the certified model of the Hunt patent, does it not appear that the lower bent portion of the inverted troughs do not lap by the upturned edges of the troughs which receive the water?

A. Yes, and I perceive also that they would not prevent drip-water from falling through into the provision chamber, so I cannot regard the model as conclusive in that particular against the drawings.

C. Q. 148. In the model of the Hunt patent, the upturned flanges are integral with what is properly the bottom of the ice-chamber, are they not?

A. They are, but also in the model much smaller than shown in the drawings.

349 C. Q. 149. If the lower troughs were removed in the Hunt patent, would not the air then pass very freely through into the provision chamber from the ice-chamber?

A. If the lower troughs were removed, the spaces between the inverted troughs would then be open and while the air would pass freely into the provision chamber, drip-water would also.

C. Q. 150. In your opinion, a trough with an upturned flange, thereby breaking the air current, compelling the air to rise and pass laterally over the flange or edges of the trough, would necessarily be a departure from the Hambrook invention, would it not?

A. If it compelled the air to rise and pass over as in the Hunt and Law patents, then it would be an obstruction.

C. Q. 151. How many elements enter into the claim of the Hambrook invention? Please point them out and name them.

A. Well, there is a provision chamber or chambers, an ice-chamber provided with a support for the ice and a bottom below the same, which bottom is inclined and is provided with a central opening. There is also a deflector plate above said opening to prevent drip-water from falling down through, side passage or passages for the warm air, the trough and pipe to carry away the drip-water, but this claim is to be construed and understood with reference to the statements in the specification.

C. Q. 152. Taking into consideration the statements in the specification, do you think two bottom pieces are necessarily included in the invention claimed by Hambrook?

A. I think that his bottom pieces are to be inclined to run the water to the drain pipe.

C. Q. 153. Would not a single inclined bottom piece subserve the same purpose as two inclined bottom pieces?

350 A. Just as well, but, in the construction of the refrigerator having a long central opening, it would be more convenient and easy to employ two pieces rather than one.

C. Q. 154. It would, however, be no departure from the Hambrook invention to use one bottom piece instead of two?

A. Where no advantage or variation in the result can be seen, I think it would be no departure.

C. Q. 155. Where the refrigerator is divided by the partition extending upward through the ice-chamber, so as to form two refrigerators, each refrigerator embodies the entire operation of the Hambrook invention as you stated. There would then be but one bottom piece and but one warm-air flue, and but one projection *e*. Am I correct in this statement?

A. Not necessarily correct, but the number of parts stated would be sufficient.

C. Q. 156. Would not the number of parts stated, together with other parts shown and described in the Hambrook patent, embody the full invention described and claimed in the Hambrook specification?

A. That is what I said. What I meant was that the invention would not be departed from if he should then with said division make the bottom of more than one piece, or an air passage on more than one side, or use more than one deflecting piece.

C. Q. 157. I call your attention to the Page patent, March 21, 1876, and ask you what obstacles you find in such patent to the free downward passage of the air from the ice-chamber to the provision chamber?

A. So far as that part of the Page patent shows, he provided a very free passage.

351 C. Q. 158. Will not the cold, dry air pass down from the ice-chamber into the provision chamber in the Page invention?

A. Certainly.

C. Q. 159. What is the function of the deflector plate shown in the Page patent?

A. In the Page invention the ice is not exposed to the circulating

air, and in that respect it is inferior, the ice being contained within a close chamber; whatever cooling effect there is upon the circulating air is due to the coldness of the walls of the chamber within which the ice is placed, and whatever condensation there may be from the warmer air coming in contact with said walls, will be deposited upon the walls and will drip therefrom into the pan or upon the bottom, designated by the letter *l*. The deflector referred to in the question is employed to prevent this drip-water from falling through into the provision chamber.

C. Q. 160. Is not the partition *l*, a full mechanical equivalent of the ice-bottom of defendant's refrigerator?

A. Considered separately and alone, it is.

C. Q. 161. Is not the deflector plate in the Page refrigerator a full mechanical equivalent of the deflector plate in the Hambrook refrigerator?

A. Considered separately and alone, it is.

C. Q. 162. Is not the function of the deflector plate in the Page refrigerator the same as the function of the deflector plate in the Hambrook refrigerator?

A. It is.

C. Q. 163. Is not the Smith refrigerator, as shown and described in the patent of July 24, 1877, a substantial equivalent of the Hambrook invention, with the exception of the form of the warm-
352 air flue, and if said warm-air flue were shortened and projections corresponding to the projections or deflectors *e*, *e*, of the Hambrook invention, would it not then be the same thing as the Hambrook in all practical and substantial points?

A. I will answer that question by saying that there is no matter of doubt that if the Smith refrigerator was altered so as to be just like the Hambrook refrigerator, it would operate the same way.

C. Q. 164. I do not wish to question the correctness of your last answer, and in order to obtain further light in the same direction, I will ask you if the warm-air flues of the Hambrook refrigerator were substituted in the Smith refrigerator, whether or not said Smith refrigerator would then operate in the same way and be practically the Hambrook refrigerator?

A. The answer to that question is fully comprehended in my answer to the last question. If the Smith refrigerator was altered to be like the Hambrook, then it would work like the Hambrook.

C. Q. 165. Do you not find in the specification and drawings of the Smith patent, every element which you find in the Hambrook patent, with the exception of the projections *e*, *e*, of the Hambrook patent and the lateral opening from the warm-air passages into the ice-chamber?

A. The exceptions you name are sufficient, but not all. There is no deflector K.

C. Q. 166. The exceptions named and the deflector, constitute all the differences, do they not, between the Smith refrigerator and the Hambrook refrigerator?

A. Yes, and they are sufficient.

C. Q. 167. Are these defects which you find in the Smith refrigerator, sufficient to render such refrigerator practically useless?

353 A. I never said that, but they are sufficient to make it practically inferior.

C. Q. 168. Will you explain a little more fully why the Smith refrigerator would be practically inferior to the Hambrook refrigerator?

A. Because the warm air ascends into a passage high above the ice, insulated from the ice-chamber, from which it will not descend into the ice-chamber and from the ice, without an application of force, which is just so much abstracted from the feeble forces at work in the refrigerator, and that amount of force is saved in the Hambrook refrigerator.

C. Q. 169. Why do you say in your direct examination that the Sanford refrigerator may be regarded as the foundation on which all other refrigerators have been built?

A. I didn't say that.

C. Q. 170. Did you not state, referring to the Sanford refrigerator, or the Sanford patent, as follows: "It may be regarded as the foundation on which all other refrigerators have been built, and with which all must be contrasted"?

A. Yes, I said that with these words prefixed: "So far as a consideration of the art here is concerned."

C. Q. 171. Why do you refer to the Sanford patent as being the patent on which all these other patents have been built?

A. Only because it is the earliest in date of all the patents referred to me in this matter, and because it is therefore the first which shows the general arrangement of a refrigerator and a scheme for air circulatinn which is common to all of them.

354 C. Q. 172. Was not this principle of air circulation well known in refrigerators even prior to the Sanford invention?

A. I presume so, but no earlier instance has been cited in this case.

And thereupon a recess was had until 2 o'clock.

Redirect examination by Mr. BROWN, counsel for complainant:

R. D. Q. 173. Please examine again the Chase patent No. 95423, and state whether or not you can ascertain from the drawings or the specification the areas of the conduits, *e*, *e*, and the aperture or space, *h*, so that you can say what would be the relative capacities of said openings for carrying off and receiving air from and into the provision chamber, *g*?

A. The warm-air conduits, *e*, *e*, are represented as two cylindrical pipes, each having a diameter less than one-half the thickness of the wall of the refrigerator, but the dimensions of the cold-air opening, *h*, there are no means of ascertaining. This opening is referred to as apertures. Whether they are in the form of slots or circular holes I do not know. In the claim it is referred to as cold-air aperture, but the conduit is also referred to in the singular. Their relative areas I cannot tell.

R. D. Q. 174. Do you find in this patent any statement or any description of a construction other than that shown in the drawings?

A. I do not find any modifications suggested, except that the air pipes *e* may be located somewhere not in the wall of the refrigerator.

R. D. Q. 175. The patent states, "the upper portion *a* of the structure A, is preferably, contracted in size, and," etc. From this language, would it follow that a mechanic having only the
355 Chase device before him, would widen this upper portion *a*, making the conduits *e e* more nearly straight in their lower portions, and direct the same at their upper portion into the compartment *f* at *the* about the height of the ice instead of on top of the ice, as herein shown, in attempting to produce a box, the equivalent of the Chase box; and in producing such a device, would he be exercising only mechanical skill?

A. I do not think the patent would justify the changes in the form of their conduits mentioned in the question, and I do not think such changes would come within the definition of mechanical skill.

R. D. Q. 176. Suppose an intelligent mechanic had before him all the alleged anticipating devices set forth in defendant's exhibits in this case, would he simply by the use of his mechanical skill be able to produce a structure like that shown in the Hambrook patent if he had not in mind the purpose of the Hambrook invention, as you have set forth in your testimony?

A. No, I think not.

R. D. Q. 177. Do you regard any construction of refrigerator having one or more openings, other than the doors, through which external air may be admitted to the interior of the refrigerator, and irrespective of the precise form of the interior construction, as being capable of producing the same results as are produced by the Hambrook refrigerator?

A. Well, I am not prepared to say that openings to the external air would make any difference. It is a point I have not considered.

R. D. Q. 178. State, whether or not, in giving the opinions you have expressed, you have been influenced in any way by the deposition of the expert witness, Dayton, heretofore given in this case.

A. No; haven't read it.

R. D. O. SMITH.

356 *Notary's Certificate.*

UNITED STATES OF AMERICA.

STATE OF ILLINOIS, } ss:
County of Cook, }

I, P. H. T. Mason, a notary public in and for the county of Cook and State of Illinois, do hereby certify that the foregoing depositions of Julia Litchfield, Eliza Lowe, Walter M. Howland, Charles Lund,

George Victor Lund, P. B Sheridan, John Lewis, Albert M. Osgood, Melville E. Dayton, John Buckley, Lodore D. Tanner, William A. Stanton and R. D. O. Smith were taken by and before me, pursuant to notice, at the office of Poole & Brown, No. 225 Dearborn street, Chicago, Illinois, commencing on Tuesday, the 28th day of January, 1890, at 2 o'clock p. m., and continued from day to day until completed as therein appears, that said depositions were taken on the part of the complainant, to be used on the hearing of a certain cause now pending in the circuit court of the United States for the western district of Michigan, southern division, wherein The Belding Manufacturing Company is complainant and The Challenge Corn Planter Company is defendant; that the parties to said cause were present at the taking of the same, complainant by its counsel Taylor E. Brown, Esq., and defendant by its counsel Edward Taggart, Esq., as therein appears; that before deposing, the said Julia Litchfield, Eliza Lowe, Walter M. Howland, Charles Lund, George Victor Lund, P. B. Sheridan, John Lewis, Albert M. Osgood, Melville E. Dayton, John Buckley, Lodore D. Tanner, William A. Stanton and R. D. O. Smith were by me duly sworn to testify the truth, the whole truth, and nothing but the truth, in the cause aforesaid, and
357 their depositions reduced to writing by me from their statements, and the same duly subscribed by the said witnesses before me.

And I do further certify that I am neither attorney nor of counsel for any of the parties in said depositions or caption named, and am in nowise interested in the result of said cause.

In testimony whereof I have hereunto set my hand and affixed my notarial seal this 19th day of February, A. D. 1890.

[SEAL.] P. H. T. MASON,

Notary Public in and for the County in the State Aforesaid.

358 Filed Jun- 25, 1890. C. L. Fitch, clerk.

UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan. In Equity.

BELDING MANUFACTURING CO., Complainant,
vs.
CHALLENGE CORN PLANTER CO., Defendant. } No. 963.

The answer of The Challenge Corn Planter Company, defendant, to the bill of complaint of The Belding Manufacturing Company, complainant.

This defendant now and at all times hereafter saving and reserving unto itself all manner of benefit of exception to the manifold errors and insufficiencies in said complainant's bill of complaint contained, in answer thereto, or unto so much thereof as this defendant is advised is material or necessary for it to make answer unto, answering says:

I.

It admits upon information and belief that letters patent of the United States were granted to Richard T. Hambrook on or about the 2d day of March, 1878, but it denies that said Richard T. Hambrook was the first and original inventor or discover- of certain new and useful improvements in refrigerators therein described; and it denies that said letters patent were of any validity or secured to the said Richard T. Hambrook any exclusive rights whatever.

359 II.

This defendant further says that it has not been informed save by said bill, whether complainant has become entitled to any rights and privileges pretended to have been secured by said letters patent or any portion thereof, or whether the complainant is now the sole and exclusive owner of said letters patent, and it therefore neither admits nor denies the matters alleged in the second and third paragraphs of said bill of complaint, but leaves the complainant to its proofs therein.

III.

Upon information and belief this defendant denies that said complainant became and is the sole and exclusive owner of any invention or improvements described in said letters patent or any exclusive rights whatever.

IV.

Upon information and belief this defendant denies that said Richard T. Hambrook after the granting of said letters patent manufactured and sold large quantities of refrigerators containing the said invention, and has made large profits and gains thereon, and it denies that the complainant has made, sold, or used large quantities of said refrigerators, and it says on information and belief that the invention described in said letters patent was not introduced into public use by the said Richard T. Hambrook nor by said complainant, and that neither said Hambrook nor said complainant has made, sold, or used any refrigerators constructed in accordance with such letters patent.

V.

This defendant further says that since the date of issuing of said letters patent it has not been engaged, nor is it now engaged in making, using, or vending refrigerators such as are described and claimed in the claim of said letters patent, but that all the refrigerators which have been made by this defendant are of a
360 different form, and construction from that described in said letters patent and claimed in the claim thereof, and it says that its actions and doings in the matter have not been an infringement of any rights secured by said letters patent to the said Richard T. Hambrook.

VI.

And this defendant denies that the complainant has been damaged or injured in any sum whatever by the manufacture, sale or sale by it of any refrigerators manufactured, sold, or used by this defendant. And it further denies that it is now continuing or intending or threatening to continue hereafter any unlawful manufacture and sale of any invention secured as aforesaid by said letters patent. And this defendant further denies that it has received or is receiving any gains or profits whatever from any unlawful manufacture, use, or sale by it of refrigerators which infringe upon any claim of said patent.

VII.

Further answering this defendant says that it is informed and believes and therefore charges the fact to be, that the said alleged invention and improvements as described in said letters patent were well known to, and had been in use in the United States, and with the knowledge and consent of said Richard T. Hambrook for more than two years before his application for letters patent therefor. And this defendant further says that it has manufactured and sold refrigerators and is now engaged in the manufacture and sale of refrigerators, and it further says that such refrigerators are constructed in the ordinary form of refrigerators which are in use and which have been in use for many years previous to the date of said Hambrook patent, and that such refrigerators are not a copy or an imitation, either in their internal or external construction, arrangement or ornamentation of the refrigerators patent to said Hambrook or owned by said complainant. It further says that all the refrigerators which it has made, have been stamped so as to
361 show by whom they were manufactured, and that the purchasers of such refrigerators have never been deceived and have always known that they were the refrigerators manufactured by this defendant, and not the refrigerators manufactured by said complainant.

VIII.

This defendant further answering says upon information and belief that said Richard T. Hambrook was not the original, first and sole inventor of the improvements described in said letters patent or any part thereof; that the same or substantial and material parts thereof claimed therein as new were, before the supposed invention thereof by said Hambrook, fully described in numerous printed books and pamphlets, the names of which this defendant is not able to give at this time, but for which it is making diligent search and which it prays leave to add hereto when discovered.

IX.

Further answering this defendant says that the improvements described in said letters patent or substantial and material parts thereof claimed therein as new, were before the supposed invention

thereof by the said Hambrook described and set forth in the following letters patent of the United States, to wit:

In letters patent No. 95428, issued October 5, 1869, to A. J. Chase.

In letters patent No. 62643, issued March 5, 1867, to W. Law.

In letters patent No. 171,491, issued December 28, 1875, to J. Turner.

In letters patent No. 136,484, issued March 4, 1873, to W. Bray.

In letters patent No. 61734, issued February 5, 1867, to R. A. Harris.

In letters patent No. 193,563, issued July 24, 1877, to G. F. Smith.

362 In letters patent No. 77624, issued May 5, 1868, to A. Koch.

In letters patent No. 175,143, issued March 21, 1876, to C. B. Page.

In letters patent No. 207,356, issued August 27, 1878, to W. Horn, C. Schaefer, and F. J. Wehrle.

All of the aforesaid letters patent being for improvements in refrigerators. And also the following:

No. 188,493, issued March 20, 1877, to G. A. Banta.

No. 23803, issued April 26, 1859, to A. Yost.

No. 121,899, issued December 12, 1871, to J. Rohrer.

No. 133,147, issued November 19, 1872, to J. H. Fisher.

No. 161,928, issued April 13, 1875, to W. P. Butler.

No. 175,658, issued April 4, 1876, to G. Brown.

And in numerous other letters patent the names and dates of which this defendant is not now able to give but for which it is making diligent search and which it prays leave to add hereto when discovered. Wherefore the said letters patent are wholly void.

X.

This defendant further answering says upon information and belief that the improvements described in said letters patent, or substantial and material parts thereof claimed therein as new, had before the supposed invention thereof by said Hambrook been invented by others and were known and were in use by divers persons at divers places whose names and places of residence, as well as the names of such places of prior use, are at present unknown to this defendant, but which it prays leave to add hereto when discovered.

XI.

This defendant further says on information and belief that the said pretended invention or improvements of said Richard T. Hambrook described in said letters patent, does not in view of the state of the art as it was at and prior to the time of the pretended

363 Hambrook invention, constitute or amount to a patentable invention within the meaning of the patent law, nor was the same more than the exhibition of ordinary mechanical skill. It further says that the said claim in said letters patent did not claim

any patentable novelty, wherefore the said letters patent were and are wholly void.

XII.

And this defendant further says upon information and belief that neither said Hambrook nor the said complainant introduced the said invention to the public nor manufactured refrigerators in accordance therewith, nor took any steps to restrain the numerous manufacturers throughout the country who have been and were infringing said letters patent, if the same are valid, but on the contrary the said Hambrook and the persons to whom he made assignments of his rights in said letters patent, permitted such use and manufacture without objection; and these defendants further charge the fact to be that said letters patent and the invention thereby claimed to be secured, if the said letters patent were ever of any validity, were many years ago abandoned by said Hambrook and his assignees to the public, and the said patent which is known to the complainant to be wholly worthless is used for the sole purpose of injuring and harassing this defendant in its business, in order to secure to the said complainant the business, patronage, and custom which of right belong to this defendant.

XIII.

This defendant further shows on information and belief that the improvements described in said letters patent or substantial and material parts thereof claimed therein as new, were before the supposed invention thereof by said Hambrook known and in public use, and especially were known — the following persons, to wit: Geo. F. Smith, of Eau Claire, Wisconsin, at Michigan City, Indiana.

This defendant submits to this honorable court that the said
364 complainant is not entitled to all or any of the relief sought in said bill of complaint, and without admitting as true any of the matters and things therein stated, and not hereby sufficiently answered, prays to be hence dismissed with its reasonable costs and charges in this behalf most wrongfully sustained.

CHALLENGE CORN PLANTER COMPANY,
By LEVI SCOFIELD, *General Manager.*

ARTHUR STEM AND
TAGGART & DENISON,
Complainant's Solicitors and of Counsel.

365 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan. In Equity.

THE BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

To the honorable the judges of the circuit court of the United States for the western district of Michigan, southern division:

The Challenge Corn Planter Company, the above-named defendant, brings this its petition against the above-named complainant, The Belding Manufacturing Company, and says that heretofore to wit, on the 11th day of March, 1889, the said complainant, The Belding Manufacturing Company, filed its bill of complaint in the above-entitled court against your petitioner, alleging among other things that the said complainant was the sole and exclusive owner of the letters patent of the United States granted to Richard T. Hambrook March 2, 1878, for improvements in refrigerators, said patent being numbered 204,216. And also alleged that your petitioner is engaged in manufacturing and selling refrigerators embodying the invention claimed in said letters patent, and in infringement of the rights secured to said complainant by said patent, and in said bill prayed for an injunction against your petitioner and an accounting of all the refrigerators made and sold by your petitioner.

366 Your petitioner further shows that it is a corporation organized and doing business under and by virtue of the laws of the State of Michigan, having its principal place of business at the city of Grand Haven, in the county of Ottawa, and State of Michigan. That for several years last past it has been engaged in the manufacture of refrigerators in the said city of Grand Haven; that it has built up an extensive trade on its refrigerators, which have been constructed in a very superior manner, and which have been sent to all parts of the United States. That it has among its customers many hundreds of jobbers and retailers, and that its refrigerator has been regarded as one of the best among the various kinds of refrigerators manufactured and sold throughout the United States. That prior to engaging in such manufacture your petitioner caused examination to be carefully made of the records of patents, and carefully avoided or sought to avoid, the infringement of any of the old patents issued out of the Patent Office of the United States; and your petitioner verily believes that it has never manufactured any refrigerator which infringes upon any patent or patents not owned by your petitioner.

Your petitioner further shows that prior to filing said bill of complaint the complainant began to make public threats against your petitioner, and issued and delivered to the customers of your petitioner a large number of letters threatening suit against those who purchased refrigerators manufactured by your petitioner. That the customers of your petitioner have been greatly intimidated by the

said threats, and have refused to buy refrigerators manufactured by it, and that by reason of such threats made by the said complainant in this suit your petitioner has lost many sales of refrigerators which it would otherwise have made had such threats not been made.

Your petitioner further shows that said complainant manufactured and put upon the market its refrigerator which is now
367 claimed to be made under such letters patent, without any mark or sign to indicate that it was patented. Subsequently and after your petitioner had been manufacturing its refrigerator, as it is now manufacturing, and not until after your petitioner had built up and established an extensive trade in the manufacture and sale of refrigerators, did the said complainant mark its refrigerators as patented.

Your petitioner further shows that it has received from the trade a large number of letters sent out by the complainant to the customers of your petitioner, some of which were sent before and some since the commencement of the suit, and it attaches to this petition several of the letters showing the nature of the threats made by the complainant for the purpose of destroying the business of your petitioner, and causing your petitioner irreparable injury and damage, which letters are made a part of this petition.

Your petitioner further shows that it has filed its answer to the said bill of complaint, and that it is ready and willing to proceed to a trial upon the merits with all possible dispatch.

And your petitioner says upon information and belief that the said complainant never became the sole owner of any invention or improvements described in said letters patent, or any exclusive right whatever, and upon information and belief it denies that said Richard T. Hambrook after the granting of said letters patent manufactured and sold any refrigerators containing said invention, denies that he made any profits or gains thereon, denies that the complainant has sold or used large quantities of refrigerators containing said invention, and it says on information that the invention described in said letters patent was not introduced into public use by the said Richard T. Hambrook, or by the complainant, and that said complainant has not made, sold or used any refrigerators constructed in accordance with said letters patent.

368 Your petitioner says that since the date of the issuing of said letters patent it has not been engaged nor is it now engaged in manufacturing, using or vending refrigerators such as are claimed in said letters patent; that all the refrigerators which it has manufactured have been constructed from a different pattern. And your petitioner says that the complainant has not been damaged or injured in any sum whatever by the manufacture, sale, or use of any refrigerators manufactured, sold, or used by your petitioner.

And your petitioner is informed and believes that the said supposed invention so as aforesaid patented to Richard T. Hambrook was not invented by him; that the construction of the refrigerator particularly shown and described in the specifications of said patent

was old in substance, and that no patentable invention was involved therein; that if said patent was valid, still your petitioner has not infringed the same; that its refrigerators are not constructed upon the same principle nor in the same manner as the refrigerator shown in said letters patent, and that the refrigerator of your petitioner is not copied from the refrigerator manufactured by the complainant, but is constructed in the ordinary manner as was shown in various refrigerators manufactured throughout the country long before the date of the supposed invention by the said Hambrook.

And your petitioner further shows that the state of the art in refrigerators discloses the same or substantially the same construction as is shown and described in the specification of the said Hambrook patent.

And your petitioner begs leave to refer to the following letters patent of the United States which were issued prior to the date of the supposed invention of the said Hambrook:

Letters patent No. 95428, issued Oct. 5, 1869, to A. J. Chase.

Letters patent No. 62643, issued March 5, 1867, to W. Law.

369 Letters patent No. 171,491, issued Dec. 28, 1875, to J. Turner.

Letters patent No. 136,484, issued March 4, 1873, to W. Bray.

Letters patent No. 61734, issued Feb. 5, 1867, to R. A. Harris.

Letters patent No. 193,563, issued July 24, 1877, to G. F. Smith.

Letters patent No. 77624, issued May 5, 1868, to A. Koch.

Letters patent No. 175,143, issued March 21, 1876, to C. B. Page.

Letters patent No. 207,356, issued Aug. 27, 1878, to W. Horn, C. Schaefer and F. J. Wehrle.

All the aforesaid letters patent being for improvements in refrigerators.

And your petitioner also will produce upon the hearing one of the refrigerators now manufactured and sold by it and begs leave to refer thereto.

Your petitioner further shows that about March 1st, 1889, said Belding Manufacturing Company, in a conversation held at Chicago between its agents and attorneys and Levi Scofield, your petitioner's superintendent, stated to him that the country would be flooded with circulars to prevent the sale of your petitioner's goods.

Your petitioner further shows that refrigerators constructed with the central opening for the passage of cold air from the ice-chamber into the provision chamber of a refrigerator, with a plate for supporting the ice placed above such opening in substantially the same manner as is manufactured by your petitioner, were old and well known prior to the date of the said Hambrook invention, and that refrigerators so constructed were put upon the market before the date of the said Hambrook patent, and have been continually upon the market and are now upon the market. That such construction

370 and sale of refrigerators was, as your petitioner verily believes, well known to the complainant, and that it took no steps whatever to prevent the manufacture, sale and use thereof.

Your petitioner further says that it believes and is prepared to show not only that the said letters patent of the complainant are not infringed by the refrigerator manufactured and sold by your petitioner, but also that said patent, unless the same be limited to the specific form, which your petitioner has never constructed, is wholly invalid.

Your petitioner further shows that it is a responsible corporation and is abundantly able to meet and to pay all demands which may be assessed against it by this court by reason of such alleged infringement. That there is no reason or excuse for the conduct of said complainant in issuing and sending forth said letters, circulars, etc., and that its only object is to destroy the business of your petitioner, and to secure for itself the trade and profits which justly belong to your petitioner.

That your petitioner is being irreparably damaged by reason of the above-mentioned threats made by the complainant, and inasmuch as your petitioner can have no adequate relief except in this honorable court, it therefore prays that an injunction may be granted, restraining the complainant herein from issuing or sending any letters to your petitioner's customers or to the public, threatening suits for the infringement of the above-named patent, for selling or using refrigerators made by your petitioner, or from bringing any suits against the customers of this petitioner for infringement of said letters patent, or from otherwise molesting persons who may buy, or deal in, or use refrigerators manufactured by your petitioner, or from in any manner interfering with or injuring your petitioner's trade and business pending this suit.

And your petitioner will ever pray, etc.

CHALLENGE CORN PLANTER CO.,
By LEVI SCOFIELD, *General Manager.*

ARTHUR STEM AND
TAGGART & DENISON,
Def't's Sol's and Counsel.

371 UNITED STATES OF AMERICA, } ss:
Western District of Michigan, County of Kent, }

Levi Scofield, being first duly sworn, deposes and says that he is the general manager of The Challenge Corn Planter Company, the above-named petitioner, defendant in the aforesaid action; that he has read the foregoing petition and knows the contents thereof, and that the same is true of his own knowledge, except as to the matters therein stated on information and belief, and as to those matters he believes it to be true. And he further says that he makes and swears to this petition for and in behalf of said Challenge Corn Planter Company as its duly authorized agent, and was duly authorized to do so, and empowered to make and sign said petition in the name of said company, and to swear to the same in its behalf.

LEVI SCOFIELD.

Subscribed and sworn to before me this 23d day of March, 1889.

FRED. C. TEMPLE,
Notary Public, Kent Co., Mich.

372 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan. Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant.

In this cause, on reading and filing the answer of the said defendant, and the duly verified petition of said defendant, setting forth among other things that the said complainant is circulating among the trade and the customers of the defendant, letters and circulars claiming that the refrigerators manufactured and sold by the said defendant is an infringement of the letters patent described in the bill of complaint in this cause, and threatening to bring suit against such customers for such infringement, said petition praying for an order enjoining said complainant from such claims and threats during the pendency of this suit, and on motion of Arthur Stem, Esq., and Messrs. Taggart & Denison, counsel for said defendant, it is ordered that the said complainant appear before this court at the opening of the court on the second day of April, 1889, or as soon thereafter as counsel can be heard, and show cause why the prayer of said petitioner should not be granted: Provided, that a copy of this order and of said petition be served upon the
373 complainant's solicitors in this cause at least five days before the said day of hearing.

H. F. SEVERENS,
District Judge.

At chambers, dated March 26, 1889.

STATE OF MICHIGAN, } ss:
County of Kent, }

Arthur C. Denison, of said county, being duly sworn, says that on the 28th day of March, 1889, at 9.50 o'clock in the forenoon, he served upon Messrs. Poole & Brown, solicitors for the complainant in the cause therein entitled, a certain copy of order of which the annexed paper, which is made a part of this affidavit, is a true and compared copy, and also true copies of the answer and petition therein referred to, by delivering the same to and leaving the same with Mr. Brown, one of said solicitors, personally, at their office in the city of Chicago, Ill.

ARTHUR C. DENISON.

Subscribed and sworn to before me this second day of April, 1889.

ADOLPH B. MASON,
Notary Public, Kent County, Michigan.

Circuit Court of the United States, Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTRING COMPANY, Complainant,
vs.
THE CHALLENGE CORN PLANTING CO., Defendant.

This cause coming on to be heard upon the petition of the defendant herein for an injunction to issue against the complainant to restrain it from commencing or prosecuting, or threatening to commence or prosecute any suits against any of the vendees or
374 vendees of the vendees of the defendant for the use or sale of the refrigerators manufactured by the defendant, The Challenge Corn Planter Company, or sales by it or its agents, and also from sending out any letters, circulars or circular letters to any person or persons, firm, corporation, or copartnership who have purchased or may purchase refrigerators from the defendant or of the defendant's vendees until after the final determining of this suit upon its merits, and the case having been fully argued by the counsel for the respective parties, the court doth order that The Belding Manufacturing Company, complainant herein, be restrained and barred from commencing or prosecuting, or threatening to commence or prosecute any suit against any vendee of the defendant, or vendee of the vendee of the defendant herein for any alleged infringement of any letters patent involved in this case, and on which this suit is brought, based upon the use or sale by said vendee or vendees of any refrigerators purchased of this defendant or of the vendee or vendees of this defendant; that the said complainant, The Belding Manufacturing Company, its agents, representatives or attorneys, be restrained from sending out any letters, circulars or circular letters threatening suit, or announcing directly or indirectly that suit will be brought against the purchasers of the refrigerators manufactured and sold by the defendant, provided that the said defendant shall file a bond in this cause in the sum of five thousand dollars with security approved by the court for the payment of any damages that may be adjudged against the said defendant in the above-entitled cause, and provided that if the complainant shall find any refrigerators believed by it to infringe upon said letters patent and shall be uncertain as to who manufactured the same and shall inquire of the defendant, this defendant shall answer whether said refrigerator was manufactured by it and shall be bound by whatever answer it may make.

Journal entry of April 2, 1889.

375 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

To the honorable the judges of the circuit court of the United States for the western district of Michigan:

The Challenge Corn Planter Co., of the city of Grand Haven, in the county of Ottawa, State of Michigan, brings this its cross-bill

against the Belding M'f'g Co. of the city of Chicago, in the State of Illinois, and which is a citizen of the State of Illinois, and thereupon your orator complains and says:

I.

That your orator is a corporation duly organized and existing under and by virtue of the laws of the State of Michigan and having its principal office and place of business at the city of Grand Haven in the county of Ottawa, and State of Michigan, and is a citizen of the State of Michigan.

II.

That the said defendant is a corporation organized, as your orator is informed and believes, under the laws of the State of Illinois, and having its business office at the city of Chicago in the said State of Illinois, but having its manufactory and its place of business at the village of Belden in the county of Ionia, in the said western district of Michigan.

III.

That heretofore, to wit, on the 11th day of March, 1889,
376 said defendant, The Belding M'f'g Co., filed its bill of complaint in this court against your orator as defendant, said bill alleging that the said Belding M'f'g Co. was the sole owner of letters patent of the United States No. 204,216, issued March 2, 1878, to Richard T. Hambrook for certain improvements in refrigerators; that your orator was guilty of an infringement of said letters patent, and praying an injunction and an accounting thereon against your orator; that your orator has caused its answer to said bill, denying said infringement, to be prepared and executed, and the same is submitted to the court herewith, as by the said bill of complaint and the said answer, reference thereto being had, will more fully appear.

IV.

Your orator further shows that it never has in any manner infringed, nor is it now infringing, any exclusive right secured to the said Belding M'f'g Co. by the said letters patent.

V.

Your orator further shows that it is, and for some years last past has been, engaged in the city of Grand Haven in the manufacture of refrigerators and the sale of the same throughout the United States; that its said refrigerators do not infringe any valid claim of the said Hambrook patent, and that the absence of such infringement is so apparent upon an inspection of said letters patent and the state of the art as disclosed by the public records, that your orator believes, and therefore charges the fact to be, that the claim of infringement of said letters patent, and the threats of suit thereon hereinafter referred to, have been, and are being, made by the said Belding M'f'g Co. in bad faith, and without any reasonable or probable cause for belief that such infringement in fact exists.

VI.

Your orator begs leave to refer to the following letters patent of the United States prior in date to the said Hambrook patent,
377 and fully anticipating the same, or showing the state of the art to be such that the said Hambrook patent must be limited to the exact form and description shown and described.

(List same as in petition.)

All the aforesaid letters patent being for improvements in refrigerators.

VII.

Your orator further shows that it is informed and believes that a few refrigerators were manufactured by persons connected with the said Richard T. Hambrook soon after the said patent issued, and before the said Belding M'f'g Co. became connected therewith, constructed in accordance therewith, and after the said Belding M'f'g Co. purchased said letters patent and began to manufacture refrigerators it did not mark its refrigerators patented, nor apparently claim there was any patent thereon for a long time, nor did it first publicly make such claim in any way, so far as your orator has ever been informed, until after your orator had engaged in the said business and established an extensive trade in refrigerators; and that the refrigerators now manufactured by the said Belding M'f'g Co. and by it marked patented, are not constructed in accordance with the specification and claims of the said Hambrook patent.

VIII.

Your orator further shows that after engaging in such business, and prior to the time of committing the grievances by the said defendant alleged, your orator had built up an extensive trade in refrigerators throughout the United States, and had secured for its customers hundreds of jobbers and retailers throughout the country. That its said refrigerator gave good satisfaction, and was considered one of the best on the market, and that its said trade was constantly increased and extending, and your orator was daily acquiring great gains and profits thereby, which said gains and profits were constantly increasing, and your orator believes would have continued to increase except for the acts of the said defendant hereinafter set out.

378 IX.

Your orator further shows that about the month of February, 1889, the said Belding M'f'g Co. began and ever since have continued to circulate among the refrigerator trade throughout the country, and particularly among your orator's customers wherever they could be found, letters claiming that the refrigerators so manufactured by your orator was an infringement of the Hambrook patent, and threatening suit against all persons buying or using the same, and your orator has received from its customers many of such let-

ters, and its customers and the trade generally are, because thereof, refusing further to buy refrigerators of your orator, fearing they would be sued for infringement upon said Hambrook patent, and the business of your orator has been and is being thereby irreparably injured. Your orator is also informed and believes that the said defendant has by its agents and salesmen orally made to your orator's customers and the trade generally similar statements and threats.

X.

Your orator further shows that the said defendent by one of its officers, has stated to your orator that if your orator did not cease the manufacture and sale of such refrigerators, it, the said defendant, would flood the country with circulars threatening suit as aforesaid.

Inasmuch, therefore, as your orator is without remedy in the premises except by this cross-bill in the said suit so commenced by said defendant against your orator, and to the end—

1. That the said defendant, The Belding M'f'g Co., may full, true, direct and perfect answer make to this your orator's bill of complaint, but without oath, answer under oath being hereby expressly waived, and that as fully and particularly as if the same were repeated and it thereunto particularly interrogated.

2. That the said defendant, its officers, counsellors, agents,
379 attorneys, salesmen and employés may be enjoined and restrained by the order of this court from making orally or in writing any statements or claims that the refrigerator manufactured and sold by your orator is an infringement of the letters patent owned as aforesaid by the said defendant, and from in any manner threatening to commence any suits against any persons based upon such alleged infringement, and from commencing any such suits in any court.

3. That it and they may be so enjoined pending this suit and until the further order of the court in the premises.

4. That it be decreed to pay the costs of this suit.

5. And that your orator have such other and further relief in the premises as is agreeable to equity and good conscience.

May it please the court to grant unto your orator the writ of subpœna issuing out of and under the seal of the honorable court directed to the said defendant, The Belding Manufacturing Company, commanding it at a time to be therein named, to be and appear before this honorable court, and abide the order and decree thereof in the premises, and also writs of injunction both temporal and permanent, enjoining and restraining said defendant as above prayed. And your orator will ever pray, etc.

CHALLENGE CORN PLANTER CO.,
By LEVI SCOFIELD, *Gen. Manager.*

ARTHUR STEM AND
TAGGART & DENISON,
Solicitors for Complainant and of Counsel.

STATE OF MICHIGAN, } ss:
County of Kent, }

Levi Scofield, of Ottawa county, Michigan, being duly sworn, says that he is superintendent of The Challenge Corn Planter Co., the above-named complainant; that he signed the name of
380 said complainant to said bill and now verifies the same for and on behalf of said complainant and is duly authorized so to do; that he has read the foregoing bill by him so subscribed, and knows the contents thereof and that the same is true of his own knowledge, except as to the matters therein stated on information and belief, and as to those matters he believes it to be true.

LEVI SCOFIELD.

Subscribed and sworn to before me this 23d day of March, 1889.

FRED. C. TEMPLE,
Notary Public, Kent Co., Mich.

UNITED STATES OF AMERICA:

The Circuit Court *for* the United States for the Sixth Circuit and Western District of Michigan, Southern Division. In Equity.

CHALLENGE CORN PLANTER COMPANY, Complainant,
vs.
BELDING MANUFACTURING COMPANY, Defendant.

The replication of The Challenge Corn Planter Company, complainant, to the answer of The Belding Manufacturing Company, defendant.

This repliant saving and reserving to itself now and at all times hereafter, all and all manner of benefit and advantage of exception which may be taken to the manifold insufficiencies of the said answer for replication thereunto, say- that it will aver, maintain and prove its bill of complaint to be true, certain and sufficient in the law, to be answered unto; and that the said answer is uncertain, untrue, and insufficient, to be replied unto by this repliant without this, that any other matter or thing whatever in the said answer contained, material or effectual in the law, to be replied unto, and not herein and hereby well and sufficiently replied unto,
381 confessed and avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver, maintain and prove, as this honorable court shall direct, and humbly pray- as in and by its said bill it has already prayed.

TAGGART & DENISON AND ARTHUR STEM,
Solicitors for Complainant.

Dated this 5th day of August, A. D. 1889.

United States Circuit Court, Southern Division of the Western District of Michigan. In Equity.

BELDING MANUFACTURING CO.
vs.
CHALLENGE CORN PLANTER CO. } No. 963.

Stipulation.

It is hereby stipulated by the counsel for the respective parties to the above-entitled cause that testimony on behalf of either party may be taken before any notary public and read at the hearing with the same force and effect as if taken before a special examiner appointed by the court. It is further stipulated that the uncertified copies of United States letters patent may be introduced in evidence and used at the hearing with the same force and effect as though certified.

Signed at Chicago, Illinois, this 10th day of April, 1889.

POOLE & BROWN,
Solicitors for Complainant.

Signed at Cincinnati this 12th day of April, 1889.

ARTHUR STEM,
Solicitor for Defendant.

382 UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

THE BELDING MANUFACTURING CO., Complainant,
vs.
THE CHALLENGE CORN PLANTER CO., Defendant.

Testimony on the part of defendant taken before Paul F. Coste, Esq., a notary public in and for the city of St. Louis and State of Missouri, at No. 421 Olive street, St. Louis, Mo., on the 5th day of November, 1889, pursuant to the notice hereto annexed.

Present: Taylor E. Brown, Esq, counsel for complainant, and Levi Scofield, Esq., an officer of the defendant company.

JAMES ELWOOD SMITH, of lawful age, being produced, sworn and examined on the part of the defendant, deposes and says:

My name is James Elwood Smith. I reside in the city of St. Louis, Missouri. My occupation is director of the Simmons Hardware Company, and I attend to the buying of department No. 5, which includes refrigerators.

Q. 1. How long have you been so engaged?

A. As buyer I have been engaged about 6 or 7 years.

Q. 2. You may state whether or not you as agent for the
383 Simmons Hardware Company of St. Louis, Mo., purchased any refrigerators of the Belding Manufacturing Co. of Chicago,

Ills., or Belding, Michigan, and if so how many did you purchase and when were such purchases made?

A. Something over eleven hundred. I can give it to you exactly, if you wish.

Q. 3. When and with whom did you first contract for the refrigerators and was the contract verbal or written?

A. I contracted for the first with the agent of the Belding M'f'g Co., named Hotchkiss. To the best of my recollection the contract was a verbal one. I don't remember our ever having anything in writing, if we did.

Q. 4. In what manner were the refrigerators purchased by you of the Belding M'f'g Co. for the Simmons Hardware Co marked or stencilled?

A. They were made with the name plates marked, "I. C." They were otherwise marked on the back of the refrigerator showing that they were made especially for us.

Q. 5. You may state whether or not any such refrigerators contained any marks of any kind or description showing that they were patented, or any words or figures to indicate that they were patented.

A. None that I know of.

Q. 6. You may produce, if you can, and attach to your deposition, the invoice bills, or, if the invoice bills cannot be produced, copies of the invoice of such bills.

A. I can produce copies of them. I have not got the originals. I now produce duplicate copies of all the invoices from the time we began taking these goods from the Belding M'f'g Co.

(Same are offered in evidence on behalf of defendant.)

(The papers produced by witness are marked by the notary "Defendant's Exhibit Invoices Refrigerators Purchased of the Belding M'f'g Co., sheets 1 to 25, both included.")

(Counsel for complainant objects to each of the foregoing exhibits as incompetent, irrelevant and immaterial and also because not the best evidence.)

384 Q. 7. You may produce if you can and identify one of the refrigerators which you say you purchased for the Simmons Hardware Co. of the Belding M'f'g Co.

A. I can, and now produce the same.

(Said refrigerator is marked by the notary by tag tacked on the inside of lid, "Defendant's Exhibit Simmons Hardware Co.'s Refrigerator," and said exhibit is now offered in evidence.)

(Objected to by complainant's counsel as incompetent, immaterial and irrelevant.)

Q. 8. You may now examine the marks on this refrigerator exhibit and after examining them you may state whether all these refrigerators shown by the invoices were so marked.

A. To the best of my knowledge they were all marked in the same way as the exhibit; except of course the numbers of the different sizes. The name plate contains, "The I. C. refrigerator, Sim-

mons Hardware Company, St. Louis, Mo." The stencil on the back of refrigerator, "Manufactured for Simmons Hardware Co., St. Louis, Mo."

Q. 9. Does the Simmons Hardware Co. have a catalogue showing these refrigerators? If so, will you produce one and attach it to your deposition?

A. We have a catalogue showing these refrigerators. I now produce the same.

(Said catalogue is marked by the notary "Defendant's Exhibit Catalogue, 1889, Simmons Hardware Co.," and said exhibit is now offered in evidence by defendant.)

(Objected to by complainant's counsel as incompetent, immaterial and irrelevant.)

(Defendant now offers in evidence a catalogue and same is marked "Defendant's Exhibit Catalogue, 1889, Belding Manufacturing Co.")

Q. 10. You may state—I hand you the catalogue of the Belding M'f'g Co. of 1889, and the catalogue of the Simmons Hardware Co. of 1889, and ask you to point out the difference, if any exists,
385 between the "New Perfection refrigerator" as shown in the Belding catalogue and "the I. C. refrigerator" as shown in the Simmons Hardware Co. catalogue, both internally and externally, so far as the mechanical construction is concerned?

(Objected to by counsel for complainant as calling for the opinion of an expert when the witness has not qualified as such. Also as irrelevant, incompetent and immaterial.)

A. As I understand it, the interior construction of both refrigerators is the same, but in making our contract with the agent of the Belding M'f'g Co. the exterior of the "I. C." refrigerator was to be made different from the "New Perfection," for the reason that we wanted a refrigerator distinctively our own.

Q. 11. When contracting for these refrigerators did you have the catalogue of the Belding M'f'g Co.'s "New Perfection" refrigerator?

A. I was shown their catalogue at the time.

Q. 12. Did you understand at the time of contracting with Mr. Hotchkiss for these refrigerators, that they were to be in all respects just the same as the "New Perfection" refrigerator, so far as the internal construction and circulation was concerned?

(Objected to by complainant's counsel as leading and as incompetent, irrelevant and immaterial.)

A. Yes, sir.

Q. 13. Did or did not Mr. Hotchkiss, at the time he contracted with you for these goods, represent or give you to understand in any way that the Belding M'f'g Co. held or owned any patent that covered the construction of these refrigerators?

(Objected to as incompetent, immaterial and irrelevant.)

A. I have no recollection of anything having been said about patents at all.

Q. 14. In answer to question 8 you have stated there were certain marks on the refrigerator. I would now ask you if on a further examination you find any other marks additional to those you mentioned at that time?

386 A. Yes, sir. I find the number 43467 stamped upon the back of the exhibit refrigerator and the same number on the edge of one of the doors.

Q. 15. Do you know in what year the exhibit refrigerator was purchased of the Belding M'f'g Co.?

A. Yes, sir. During the present year.

Q. 16. You may state, if you know, who has the care of getting up the exhibit catalogue—compiling the same—for the Simmons Hardware Co.

A. I do.

Q. 17. You may state if you had any other catalogue as an auxiliary or help in getting up this catalogue, and if so what it was and why you used it?

A. I have used the Belding M'f'g Co.'s catalogue for the purpose of getting the proper description of the refrigerators as to dimensions, etc.

Q. 18. Can you state what are the corresponding numbers of the same size refrigerators in the two exhibit catalogues—the Belding and Simmons catalogues?

A. Well, we have fixed the number zero to the Belding numbers in making our own, the Simmons number—thus, their number "6" became our "60," etc. At that time we did that, but I am not sure that the Belding M'f'g Co. retained the same number which they originally had.

Q. 19. I notice in the invoice of December 22d, 1886, one sample refrigerator No. 80. In the invoice of December 20, 1886, one sample refrigerator No. 70, neither of which are designated by any name. I also notice in the invoice of January 4th, 1887, one No. 10 North Pole refrigerator and one No. 30 North Pole refrigerator. Do you know whether those refrigerators were the same in construction as the refrigerators marked "I. C."?

A. Yes, sir, just the same. At that time we had not decided definitely as to what name we would sell our refrigerators under, and these refrigerators were submitted to us as samples show-

387 ing the style and finish of the goods, and we afterwards decided on the name "I. C.," and all those furnished after that time were so marked.

Cross-examination by TAYLOR E. BROWN, Esq.:

X Q. 1. Give the date, as nearly as you can recollect it, when you purchased and received from the Belding M'f'g Co. the defendant's exhibit refrigerator which you have here produced.

A. During the month of February, 1889.

X Q. 2. Has that refrigerator been in your possession from that date until this morning, and if not state in whose possession it has been during all or any portion of this period?

A. It has not been in our possession all of the time during that interval, but I can't say positively as to whom it was sold to.

X Q. 3. How long have you had it in your possession immediately prior to producing it here?

A. Several weeks.

X Q. 4. State the circumstances under which it again came into your possession about several weeks ago.

A. Mr. Scofield came to me and asked me for one of the "I. C." refrigerators, as he wished to see whether or not there were any patent marks on it; and upon investigation I found that we were entirely out of the refrigerators, not having a single one in stock to show him. Mr. Scofield then asked me if I knew of any party to whom one of these refrigerators had been sold and going to the manager of our retail department, he informed me that he did know of a certain party to whom one had been sold, and this exhibit refrigerator was obtained from this party.

X Q. 5. State, if you know, the name of the person to whom you have referred in the last preceding question.

A. I do not know the name, as the matter was turned over to the manager of the retail department, who attended to it.

X Q. 6. Give the date, without referring to Exhibit In-
388 voices, when you first purchased any refrigerator from the complainant.

A. During the latter part of the year 1886.

X Q. 7. And you have purchased refrigerators from it from time to time since, have you not?

A. Yes, sir.

X Q. 8. Do you still purchase refrigerators from the complainant?

A. We have, up to this time; but they have not yet called upon us with the view of continuing our relations for another season.

X Q. 9. State about how many refrigerators you have purchased to date from the Belding Co.

A. Something over eleven hundred.

X Q. 10. And how many of this number were specially marked with the "I. C." designation?

A. All of them excepting the few which were first submitted to us as samples, not to exceed a half a dozen.

X Q. 11. Was Mr. Hotchkiss the only person with whom you, or other persons acting for the Simmons Hardware Co., made the arrangement of which you have testified, by which the Belding Co. were to mark the refrigerators sold to your company with a special designation?

A. All of our arrangements were made through Mr. Hotchkiss, excepting what little was done through correspondence.

X Q. 12. When was this arrangement made with Mr. Hotchkiss?

A. Some time during the latter part of the year 1886.

X Q. 13. Was it before or after the purchase of the sample refrigerator referred to in answer to cross-question 10?

A. I think it was before.

X Q. 14. You do not now undertake to state that at the time re-

ferred to Mr. Hotchkiss did not inform you that the Belding Co.'s refrigerators were manufactured under a patent or patents owned or controlled by said Co., do you?

389 A. I don't remember his saying anything at all to me about patents and am quite positive that nothing was said.

X Q. 15. What refrigerators do you offer for sale under the name "the improved Siberia refrigerator," as shown on pages 34 and 35 of Defendant's Exhibit Simmons Hardware Co. Catalogue?

(Objected to by defendant as irrelevant and immaterial, and not a proper cross-question.)

A. We are at present selling a refrigerator furnished us by the Challenge Corn Planter Co., of Grand Haven, Mich.

X Q. 16. What refrigerator and by whom made did you formerly sell by that designation?

(Objected to by defendant as irrelevant and immaterial, and not a proper cross-question.)

A. Those made for us by the Grand Rapids Refrigerator Co., of Grand Rapids, Mich.

X Q. 17. Does the cut on page 34 of the Defendant's Exhibit Simmons Hardware Co. Catalogue substantially represent the refrigerators referred to by you in answer to the last two preceding questions?

A. Not exactly; but it substantially shows the principle of circulation.

X Q. 18. Where did you obtain the cut from which this illustration was printed?

A. From the Challenge Corn Planter Co.

X Q. 19. State whether or not the cut on page 42 of the Simmons Hardware Co. catalogue substantially represents the refrigerators furnished said company by the Belding Co.

A. It does, so far as the principle of circulation goes.

X Q. 20. Point out any differences which you observe in the illustrations printed on pages 34 and 42 of the Simmons Hardware Co. catalogue.

A. The difference that I notice between these two particular illustrations is that the warm air seems to be taken into the ice-

390 chamber of the "I. C." refrigerator at a point a little higher up than in the Siberia. I do not think that either of the illustrations properly or fully illustrate the goods as made.

X Q. 21. State in what respects corresponding sizes of the "I. C." and the "Siberia" refrigerators handled by you this season for sample differ in either construction or principle of operation.

(Objected to by defendant as immaterial and irrelevant, and not a proper cross-question.)

A. As before stated, the one admits the warm air in the ice-chamber at a different point from the other, but the principle of circulation is similar; but the outside construction is entirely different, and the finish is somewhat different.

X Q. 22. State again the conversation you had with Mr. Hotchkiss about marking the goods specially for your company.

A. The understanding was that they were to put name plates on them bearing our own brand, "I. C.," and that they were to be stenciled with our name as being made especially for us.

X Q. 23. Was anything said about not having the name of the manufacturers on the goods?

A. Nothing especially. But it was understood that the goods were to have one stencil on showing that they were made for us.

X Q. 24. Give the date when you changed from the Grand Rapids Co.'s goods to the Challenge Co.'s goods.

(Objected to by defendant as irrelevant and immaterial, and not a proper cross-question.)

A. I think about January, 1888.

X Q. 25. Can you state of your own knowledge that none of the refrigerators sold to your company by the Belding Co., other than the exhibit refrigerator, had affixed thereon letters or figures designating or intending to designate the goods as patented, or as being manufactured under a patent?

391 A. Not having examined each and every one of them, I am not able to say positively that they did not.

JAMES ELWOOD SMITH.

Sworn to and subscribed before me this 5th day of November, 1889.

PAUL F. COSTE,
Notary Public, City of St. Louis, Mo.

STATE OF MISSOURI, }
City of St. Louis. }

I, Paul F. Coste, a notary public in and for said city and State, duly authorized to administer oaths, do hereby certify that on the 5th day of November, 1889, commencing at 10 o'clock in the forenoon of that day, the deposition of James Elwood Smith, witness on the part of the defendant in the case entitled in the caption hereto, was taken before me at my office, No. 421 Olive street, in the city of St. Louis, Mo., at the request of the defendant in said cause, and pursuant to the notice, a copy of which is hereto annexed. That said witness was by me first duly sworn to testify the truth, the whole truth and nothing but the truth in said cause, and said witness was examined by Levi Scofield, Esq., an officer of said defendant company, and was cross-examined by Taylor E. Brown, Esq., counsel for the complainant, and the testimony of said witness was reduced to writing in the presence of said witness and the counsel therein noted as present; and said testimony was read over by said witness and by him subscribed as and for his deposition in said cause. And I further certify that the exhibits offered in evidence by defendant are duly marked by me and retained in its possession under stipulation herein. And I further certify that I have no interest whatever in the result of this suit, and that at the conclusion

of the foregoing deposition, by consent of counsel, the further taking of depositions on behalf of the defendant is adjourned until Tuesday, November 12th, 1889, at Detroit, Michigan.

392 In witness whereof, I have hereunto set my hand and seal this 5th day of November, 1889.

PAUL F. COSTE,
Notary Public, City of St. Louis, Missouri,
for Term Ending June 28, 1893.

Notary fees, $16.95, paid by defendant.

PAUL F. COSTE, *N. P.*

UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

THE BELDING MANUFACTURING COMPANY, Complainant,
vs.
THE CHALLENGE CORN PLANTER COMPANY, Defendant.

Testimony on the part of the defendant, taken before George H. Lothrop, a notary public in and for the city of Detroit, and State of Michigan, at No. 70 Griswold street, Detroit, Michigan, on the 12th day of November, 1889, pursuant to notice hereto annexed.

Present, Taylor E. Brown, counsel for complainants, and Edward Taggart, as counsel for defendant.

CHARLES H. JACOBS, of lawful age, being produced, sworn and examined on the part of the defendant, deposes and says:

Q. 1. State your name, age, residence and occupation?

A. Charles H. Jacobs, 34 years, Detroit, Michigan; am a wholesale hardware merchant.

Q. 2. With what firm or company are you engaged?

A. I am a member of the firm of Buhl, Sons & Company.

Q. 3. How long have you been with said company?

A. Fourteen years.

Q. 4. Are you acquainted with the refrigerators manufactured by the Belding Manufacturing Company of Belding, Michigan?

393 A. I am.

Q. 5. State whether or not Buhl, Sons & Company purchased any of the refrigerators in the year 1885?

A. They did.

Q. 6. State, if you know, who made the purchase?

A. I made the purchase.

Q. 7. How many were purchased during that year?

A. Two hundred and thirteen.

Q. 8. Please give the terms of purchase or contract on which the purchase was made?

A. We were to have the exclusive sale, for Detroit, of the new Perfection refrigerator, and they were to be stenciled for us with a special stencil on the back. The stencil was to read, "Buhl's Per-

fection, No. —. Manufactured for Buhl, Sons & Company, Detroit, Michigan."

Q. 9. You may state who has the contract or order which was signed (if it was signed) by the Belding Company?

A. The Belding Manufacturing Company have the original, of which we have a letter-print copy.

Q. 10. Will you please give to the notary the copy, so that it may be entered in minutes of your testimony?

A. I will, and do.

Counsel for defendant offers a copy in evidence, which is received and marked "Defendant's Exhibit Buhl, Sons & Company's Contract."

Counsel for complainant objects to the same as incompetent, irrelevant and immaterial, but does not object to such exhibit because it purports to be a copy of the original.

Defendant's Exhibit "Buhl's Perfection Refriger-tor."

The same is offered and received in evidence.

Objected to by counsel for complainant as incompetent, irrelevant and immaterial.

Q. 11. State whether or not you can produce one of the refrigerators purchased by you for Buhl, Sons & Company in 1885, and if so please produce the same.

394 A. I can and do.

The one produced is the one referred to above.

Q. 12. You may state when the refrigerator exhibit was sold by Buhl, Sons & Company, to whom it was sold, and when it again came into your possession?

A. It was sold to Mr. Frank Hancock of Detroit, May 25, 1885, and has been in his possession since until November 11, 1889.

Q. 13. That is when you received it?

A. Yes.

Q. 14. You may state what marks or stamps the refrigerator contained which you purchased from the Belding Company in 1885?

A. They were stenciled on the back "Buhl's Perfection, No. —. Buhl, Sons & Company, Detroit, Michigan." In other respects they bore the regular mark of the new Perfection refrigerator.

Q. 15. You may produce, if you can, one of the plates which was attached to one of the Belding new Perfection refrigerators.

A. I have one here.

Plate referred to is marked "Defendant's Exhibit New Perfection Refrigerator Plate."

Q. 16. State whether or not the refrigerator purchased by you from the Belding Company in 1885 contained any words or figures to indicate that such refrigerators were patented.

A. I saw no such words or figures upon them.

Q. 17. You may state whether the refrigerator offered in evidence contains the same marks with the exception of the plate, which

seems to have been lost off, as the other 213 refrigerators purchased in 1885. I do not refer to the numbers on the refrigerator.

Objected to as leading.

A. They were all alike, so far as I know.

395 Q. 18. To what extent did you examine these refrigerators, or what reason have you for knowing what was thereon contained?

A. It was my habit to examine the stock on hand every day.

Q. 19. You may state whether or not Buhl, Sons & Company had any circulars illustrating the refrigerators which were purchased by the Belding Manufacturing Company, and if so please produce a sample of one of such circulars.

A. We published a four-page circular, which I produce.

The circular referred to is produced by the witness.

Q. 20. From whence did you obtain the cuts from which the figures representing the refrigerators in Buhl, Sons & Company's circulars were made?

A. From the Belding Manufacturing Company.

Q. 21. You may state whether the circular referred to contains the styles of the refrigerators which you purchased of the Belding Manufacturing Company.

A. It does. The cut illustrating the Detroit refrigerator did not come from the Belding Company. All the others did.

Counsel for the defendant offers in evidence the circular referred to and the same is received and marked "Defendant's Exhibit Buhl, Sons & Company's Circular."

That is objected to as incompetent, irrelevant and immaterial.

Q. 22. I call your attention to the printed instructions on the inside of the top lid or cover of the refrigerator exhibit, and ask you whether or not the refrigerators purchased in 1885 all contain the same printed instructions?

A. I think our first car-load contained such instructions, but our name was substituted for that of the Belding Company after the first shipment.

Cross-examination by counsel for complainant:

396 X Q. 23. Give the date as nearly as you can recollect it when the "Exhibit Refrigerator" here produced was purchased by you from the Belding Company.

A, I cannot state the exact date, but it was in the first five months of 1885.

X Q. 24. How do you know?

A. We began buying the goods in January, 1885, and must have bought this before May 5 of that year.

X Q. 25. Did you purchase the two hundred and thirteen refrigerators all in one year?

A. We did.

X Q. 26. Were they purchased in more than one order?

A. In numerous orders.

X Q. 27. Do you recollect how many such orders?

A. I cannot give the number.

X Q. 28. Was the order of January 24, 1885, the first order for Belding refrigerators?

A. It was.

X Q. 29. State whether or not any subsequent order by you or your firm, either verbal or written, contained any different instructions regarding the quality or the marking of the refrigerators from the instructions of said order of January 4, 1885?

A. It is my recollection that we instructed the Belding Company to change their name to ours on the printed instructions inside of the cover, but that otherwise our original instructions as to marking were observed throughout the year.

X Q. 30. Prior to giving the written order or on the same date of said order, to wit, January 4, 1885, did you or any authorized member of your company have any conversation with any member of the Belding Manufacturing Company relating to your intending purchase of their goods? And if so state when and with whom such conversation was held?

A. Our order was solicited by Mr. Belding.

397 X Q. 31. State if you know Mr. Belding's initials, or whether he was an officer of the company, or can otherwise identify him?

A. I do not know his initials, but considered him an officer of the company.

X Q. 32. For how long a period was the exclusive sale of the Belding refrigerators granted to your company?

A. We understood the agreement to run from year to year.

X Q. 33. State the conversation you had with Mr. Belding as referred to by you in answer to question 30.

A. Mr. Belding wished Buhl, Sons & Company to handle his refrigerators, as we were the largest jobbing hardware house in Michigan, and agreed to get us up the goods according to the conditions embodied in our order of January 4th.

X Q. 34. Was the condition of the order which related to the marking of the refrigerators as therein specified, a condition suggested by Mr. Belding, or demanded by your company?

A. It was demanded by us.

X Q. 35. And for what reason?

A. Because we preferred to advertise ourselves rather than the Belding Manufacturing Company in distributing the goods.

X Q. 36. You may state whether or not the two hundred and thirteen refrigerators referred to were provided with any metal plates on their fronts?

A. I do not recollect that.

X Q. 37. Where, when, and from whom did you obtain the metal plate here in evidence marked "Defendant's Exhibit New Perfection Refrigerator Plate"?

A. This plate was taken from a refrigerator sold by us to Mr. C.

H. Gaston, of Detroit, in May, as I remember, of 1885. The plate was delivered to a representative of the Challenge Corn Planter Company by Mr. Gaston, and presented to us for identification about thirty days ago.

398 X Q. 38. Were all of the refrigerators purchased from the Belding Company in 1885 provided with similar plates?

A. It is my recollection that part were furnished with plates, and part without. We made no stipulation regarding plates in our original order.

X Q. 39. Did you subsequently?

A. Not as I remember.

X Q. 40. Do you wish the court to understand then that the name plates similar to that in evidence were omitted from the refrigerators delivered to you by the Belding Company, voluntarily by the said latter company?

A. We do not remember having given them any instructions regarding the name plates.

X Q. 41. Then your answer to cross-question 40 would be yes, would it?

A. They might have been omitted voluntarily, or by carelessness.

X Q. 42. You do not undertake to say that your company nor any one authorized to act for it, did not instruct the Belding Manufacturing Company to omit from the refrigerators referred to, or a portion of them, the name plate similar to defendant's exhibit, do you?

A. I do not.

X Q. 43. Were any refrigerators purchased from the Belding Company by Buhl, Sons & Company, other than the two hundred and thirteen hereinbefore referred to?

A. We purchased their goods in 1886 and 1887, and 1888.

X Q. 44. State whether or not any of the refrigerators so purchased contained or were marked with any letters or figures designating that the goods were manufactured under or in accordance with any letters patent.

A. I think our purchases for the last two years were so marked, but have no recollection as to the first year.

X Q. 45. And by the first year you mean 1886, do you?

A. Yes, the first year after the 213 purchase.

399 X Q. 46. Will you swear that the refrigerators purchased in 1886 were not so marked?

A. I will not.

X Q. 47. State whether or not you are the only person connected with the Buhl, Sons & Company who had any conversation with Mr. Belding or other member of the Belding Manufacturing Company, relating to the purchase by your company of refrigerators from the Belding Company.

A. The terms of purchase were arranged by me solely. It is possible that a conversation regarding the merits of the goods may have taken place between other members of our company and Mr. Belding.

X Q. 48. State whether or not you are the only person connected

with Buhl, Sons & Company whose duty it is to make contracts with manufacturers of refrigerators, and if yes, whether or not all questions of contract between said company and the Belding Manufacturing Company have come to your knowledge.

A. I am the only one authorized to buy this class of goods, and all questions regarding their purchase or contracts regarding them would come before me.

X Q. 49. Do you recollect that during your conversation with Mr. Belding, prior to or about the time of the order of January 24, 1885, Mr. Belding told you directly or indirectly that these refrigerators were manufactured under and in accordance with a patent owned by his company or him?

A. I cannot recollect that anything was said in regard to the patent.

X Q. 50. You do not undertake to say, do you, that Mr. Belding at the time referred to did not so inform you?

A. To the best of my knowledge the question of any patent on the Belding refrigerator was not referred to.

X Q. 51. Was any patent referred to on that occasion?

A. No reference was made to a patent in our conversation.

CHARLES H. JACOBS.

400 STATE OF MICHIGAN, } ss:
City of Detroit, }

I, George H. Lothrop, a notary public in and for said county and State, duly authorized to administer oaths, do hereby certify that on the 12th day of November, 1889, commencing at ten o'clock in the forenoon of that day, the deposition of Charles H. Jacobs, witness on the part of defendant in the case entitled in the caption hereto, was taken before me at my office No. 70 Griswold street, in the city of Detroit, Michigan, at the request of the defendant in said cause, and pursuant to the notice, a copy of which is hereto annexed. That said witness was first by me duly sworn to testify the truth and nothing but the truth in said cause, and said witness was examined by Edward Taggart, Esq., counsel for defendant company, and was cross-examined by Taylor E. Brown, Esq., counsel for complainant, and the testimony of said witness was reduced to writing in the presence of said witness and the counsel therein noted as present, and said testimony was read over by said witness and by him subscribed as and for his deposition in said cause.

And I further certify that the exhibits offered in evidence by defendant are duly marked by me and retained by counsel in their possession under stipulation herein. And I further certify that I have no interest in the result of this suit.

In witness whereof I have hereunto set my hand and seal this 12th day of November, 1889.

[SEAL.] GEO. H. LOTHROP.

401 UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

THE BELDING MANUFACTURING COMPANY, Complainant,
vs.
THE CHALLENGE CORN PLANTER COMPANY, Defendant.

Testimony on the part of the defendant, taken before Lizzie Clark, a notary public in and for the county of Cook and State of Illinois, at No. 225 Dearborn street, Chicago, Illinois, on the 16th day of November, 1889, pursuant to the notice hereto annexed.

Present: Taylor E. Brown, Esq., counsel for the complainant, and Edward Taggart, Esq., counsel for the defendant.

ALBERT A. SPEAR, being first duly sworn, in answer to interrogatories propounded to him by the counsel for the above-named defendant, testifies as follows, to wit:

Q. 1. State your name, age, residence and occupation.

A. Albert A. Spear, age forty-seven years; I am manager for the Magee Furnace Co., stoves, ranges and furnaces, and I reside in Chicago.

Q. 2. What was your occupation in 1886?

A. I was a member at that time of the firm of Spear & Converse.

Q. 3. State whether or not the firm of Spear & Converse purchased any refrigerators of the Belding Manufacturing Company in the year 1886.

A. Yes.

Q. 4. How many did your company purchase?

A. I think we purchased 520.

Q. 5. Can you produce one of such refrigerators purchased of the Belding Co. in 1886?

A. I can, and do.

402 Counsel for the defendant offers in evidence the refrigerator referred to by the witness, and the same is received in evidence, and marked "Defendant's Exhibit the Spear & Converse Refrigerator."

Counsel for complianant objects to the foregoing exhibit as incompetent, irrelevant, and immaterial.

Q. 6. You may state whether or not the 520 refrigerators purchased by Spear & Converse in 1886 contained the same marking and stenciling as the refrigerator offered in evidence excepting the figures and numbers indicating sizes.

A. To my best judgment they were.

Q. 7. You may state whether the firm with which you are now connected have still in stock some of these refrigerators purchased in 1886, and if so, how many.

A. We have, I think, got eight or ten—that is, boxes and refrigerators.

Q. 8. Well, these that you have on hand are marked like this?
A. Yes.

Cross-examination by counsel for complainant:

C. Q. 10. State when you purchased the particular refrigerator here produced.
A. In the winter of '86, I think it was.
C. Q. 11. How do you fix that date?
A. I fix it in this way, that the summer of '88 we sold the Belding refrigerator for that season, and last summer we sold another patent; we bought in '86 for the '87 trade.
C. Q. 12. Did you purchase any refrigerators like "Defendant's Exhibit Spear & Converse Refrigerator," prior to the purchase of the exhibit?
A. I don't think we did.
C. Q. 13. Which member of the firm of Spear & Converse made the purchase, or the contract for the purchase, of these Belding refrigerators in 1886?
A. I think Mr. Converse made the contract with them, as near as I can remember.
403 C. Q. 14. Do you know of the conditions of that contract?
A. I do not.
C. Q. 15. Is that contract in your possession, or can you obtain possession of it, for the purpose of examination here?
A. I would say that — have the contract, but I couldn't swear to it.
C. Q. 16. Can you or will you produce said contract here, for examination?
A. I will if we have it.
C. Q. 17. Did you personally have any conversation with any member of the Belding Manufacturing Co., any of its authorized agents relating to the purchase of these refrigerators in 1886?
A. I don't remember that I did.
C. Q. 18. Did you, or any member of or authorized agent of your firm, either in writing or orally, demand or request of the Belding Manufacturing Company, that the refrigerator which said company was to, and did furnish, to your firm, should not contain any marks or brands, indicating the Belding Manufacturing Company to be the manufacturers of said goods, or any marks indicating that said goods were manufactured under or in accordance with any letters patent?
A. I don't know the conversation that Mr. Converse had with them; I wasn't present.
C. Q. 19. You do not undertake now to say that such a demand or request was not so made of the Belding Manufacturing Company, do you?
A. I know that they would make us a special refrigerator.
C. Q. 20. And by special refrigerator, you mean what?
A. Well, I mean this, that they would make us a refrigerator and call it the Iceland.

C. Q. 21. Were the 520 refrigerators purchased in the year 1886?

404 A. Yes, I think they were purchased in '86.

C. Q. 22. Did you examine all of them personally?

A. I did not.

C. Q. 23. You cannot state then, of your own knowledge, that each of said 520 refrigerators was marked or stenciled similar to the one offered in evidence, with the exception of the numbers indicating sizes, can you?

A. No, I can't.

C. Q. 24. Did you purchase any refrigerators of the Belding Manufacturing Company in the year 1887?

A. I can't say that we did; we either purchased them in the fall of 1887 or the spring of 1888.

C. Q. 25. ——.

(Counsel for complainant here requests that a recess be taken until 2 o'clock this afternoon, for the purpose of permitting the witness to obtain and produce, if he can, the contract referred to by him in answer to the cross-question 13.)

Met pursuant to adjournment.

The witness Spear produces contract referred to and the same is identified with this record as "Complainant's Exhibit Spear & Converse Contract."

C. Q. 26. Is this the only contract your firm made with the Belding Company?

A. Yes, sir.

ALBERT A. SPEAR.

And thereupon an adjournment was taken by consent to Tuesday, the 17th of December, 1889, in the office of Taggart & Denison, Grand Rapids, Michigan.

STATE OF ILLINOIS, } ss:
County of Cook, }

I, Lizzie Clark, a notary public in and for said county and State, duly authorized to administer oaths, do hereby certify that on the 16th day of November, 1889, commencing at ten o'clock in the forenoon of that day, the deposition of Albert A. Spear, a witness on the part of the defendant in the case entitled in the caption

405 hereto, *were* taken before me at the office of Poole & Brown, No. 225 Dearborn street, in the city of Chicago, Illinois, at the request of the defendant in said cause and pursuant to the notice.

That said witness was by me first duly sworn to testify the truth, the whole truth, and nothing but the truth, in said cause, and said witness was examined by Edward Taggart, Esq., counsel for said defendant, and was cross-examined by Taylor E. Brown, Esq., counsel for complainant, and the testimony of said witness was reduced to writing in the presence of said witness and the counsel therein noted

as present, and said testimony was read over by said witness and by him subscribed as and for his deposition in said cause.

And I further certify that the exhibits offered in evidence by counsel for defendant are returned herewith duly marked. And I further certify that I have no interest whatever in the result of this suit.

In witness whereof I have hereunto set my hand and seal this 16th day of November, 1889.

LIZZIE CLARK,

[NOTARIAL SEAL.] *Notary Public in and for Cook County.*

406 UNITED STATES OF AMERICA:

Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant. } Original Bill.

Original Bill.

CHALLENGE CORN PLANTER COMPANY, Complainant,
vs.
BELDING MANUFACTURING COMPANY, Defendant. } Cross-bill.

The depositions on behalf of the defendant to the original bill and the complainant in the cross-bill entitled above, taken before Hugh E. Wilson, a notary public in and for the county of Kent, State of Michigan, at his office, at No. 83 Lyon street, in the city of Grand Rapids, in said county, commencing at ten o'clock in the forenoon of the 17th day of December, 1889, pursuant to adjournment.

Present: Edward Taggart, Esq., counsel for defendant to original bill and complainant in cross-bill, and Taylor E. Brown, Esq., counsel for complainant in original bill and defendant to cross-bill.

GEORGE R. HOTCHKISS, a witness produced on the part of the complainant being first duly sworn to tell the truth, the whole truth, and nothing but the truth, says in response to interrogatories propounded by Mr. TAGGART as follows:

Q. 1. State your name, age, residence, and occupation.

A. I am forty-nine years old. I reside in Chicago. I am at present engaged with the American Building Loan and Investment Society. My name is George R. Hotchkiss.

407 Q. 2. What experience, if any, have you had in manufacturing or selling refrigerators?

A. I have been engaged in the business since about the year 1879 I think it was, up to the first of May, 1888, exclusively. Both in the sale and manufacture of refrigerators.

Q. 3. You may give the names of the several companies with which you have been associated in the refrigerator business and state the time you remained with each of said companies, and the position or work in which you was engaged with each of said companies.

A. I commenced with the Smith Refrigerator Manufacturing Co. of Michigan City, Ind. I continued with them until the last of July, 1881. I then went to work for the Richard T. Hambrook M'f'g Co. of Chicago. I remained with them during the life of that corporation, which was afterwards called the Booth & Osgood M'f'g Co. Mr. Hambrook having sold his interest to Mr. Booth it was reorganized and called the Booth & Osgood M'f'g Co. until they failed, and it went into the hands of a receiver. W. A. Stanton was appointed receiver of that company. I remained in the employ of the receiver of the Booth & Osgood M'f'g Co. until he was discharged by the court. The Belding M'f'g Co. was organized out of the wreck of the Booth & Osgood Co. I went to work for the Belding M'f'g Co. and remained with them until May 1st, 1888. I then went to the city of Eau Claire, Wis., organized a company, built a factory, and commenced the manufacture of refrigerators under the Hotchkiss & Smith patent. I sold my interest in that concern and left there about the first of January, 1889. Since that time I have not been in the refrigerator business.

Q. 4. Was the company which you called the Smith Refrigerator Co. run under that name during the entire time that you worked for said company?

A. Yes, sir.

408 Q. 5. What was it afterwards called? And what was the name given to the refrigerator manufactured?

A. The refrigerator was called the Alaska refrigerator. It was afterwards called the Alaska Refrigerator Co. I think that is the name it goes by now.

Q. 6. You may state under what arrangement or agreement you went to work for the Belding M'f'g Co. in 1884.

A. I went to work for the Belding M'f'g Co. under the arrangement or agreement that I was to make just such a refrigerator in that company as I had a mind to. That they were to be made under my direction, under my supervision, as I had refused under any conditions to go into that company if they were to manufacture the Hambrook refrigerator. Under those terms I went to the factory and went to work, taking my own drawings with me, and the goods were manufactured just as I wanted them, under my direction and under my plan.

Q. 7. Please to state with what persons you had the conversation with reference to your engagement with the Belding Co. in 1884, and what was said in reference to your work there by those representing the Belding Co.

A. My first conversation was with H. H. Belding. He called me into his office and asked me if I would work for the Belding Co. I told him I did not know whether I would or not; it depended a good deal upon what I had to do. That if they intended to manu-

facture the Hambrook refrigerator that I would not work for them, as I would never offer any of those goods to one of my customers. I had sold them and knew that they were utterly worthless. And I refused to work for them. Afterwards Mr. Stanton came to me and told me that it was impossible for them to start up that factory, as they had no person over there who knew anything about manufacturing refrigerators, and I told him substantially the same as I told Mr. Belding, that I would not sell those Hambrook refrigerators or have anything to do with them. They told me that they did not intend to manufacture the Hambrook refrigerator; that
409 I was to go there and take my own drawings, and those refrigerators were to be built just exactly as I wanted them. And at the same time he sent a letter to the superintendent of the factory telling him that I was to go there, and that those goods were to be made under my direction. I went to the factory and remained there about three months, and the goods were made just exactly as I directed; just as I wanted them made. At the end of that time I went out on the road and sold the goods for the Belding Co. and they were a perfect success from the beginning. I remained with that company until May, 1888, acting as traveling salesman.

Q. 8. You may state whether or not the Belding Co. continued to manufacture the refrigerators designed by you during the time you were engaged with this company.

A. They did.

Q. 9. Do they still manufacture the same style of refrigerators?

A. I expect they do; they did the last time I was in their factory.

Q. 10. You may please state from what refrigerator your design was drawn. I refer to the design for the refrigerator which was made for the Belding Co. in 1884.

A. Well, all the knowledge I had of the refrigerator business I had gained while in the employ of the Smith' Co., and this refrigerator which I built was taken largely from the Alaska in its internal arrangement, the arrangement of the flues and inside of it was similar to the Alaska. The only difference there was between that refrigerator and the Alaska was I took the warm air in at the ends of the ice-chamber near the top, while the Alaska took it through the lid and discharged it through an opening in the center of the lid. Otherwise it was similar to the Alaska in construction in every way.

Q. 11. You may state, if you know, whether or not the Alaska refrigerator was manufactured in accordance with any patent,
410 and if it was so manufactured under a patent, please to give the name of the patentee and the date of the patent.

A. It was manufactured under a patent granted to Geo. F. Smith, dated July 24, 1877. It was reissued Oct. 22, 1878.

Q. 12. I now show you what purports to be a Patent Office copy of a patent issued to Geo. F. Smith, July 24, 1877, No. 193,563, and ask you if that is a copy of the patent referred to by you in your last answer?

A. It is.

The copy of patent identified by the witness is offered in evidence by counsel for the defendant, and the same is received in evidence and marked "Defendant's Exhibit the George F. Smith Patent."

Objected to by counsel for complainant as irrelevant and immaterial.

Q. 13. You may state whether, to your knowledge, it was understood that you was to manufacture a refrigerator in accordance with the Hambrook invention at Belding in 1884.

A. It was understood that we were not to manufacture the Hambrook refrigerator.

Q. 14. State whether or not the refrigerators manufactured by the Belding Co. in 1884 bore any letters or marks to indicate that such refrigerators were manufactured under the Hambrook patent or any patent.

A. Not any of them.

Q. 15. Have you examined the refrigerator now in the United States court-house in this city which purports to be a Hambrook refrigerator?

A. I have.

Q. 16. When did you examine it?

A. Yesterday.

Q. 17. Did you find such refrigerator constructed in accordance with the refrigerators manufactured by the R. T. Hambrook M'f'g Co.?

A. I did.

411 The refrigerator referred to by the witness is here offered in evidence by the counsel for the defendant and is received and marked "Defendant's Exhibit the R. T. Hambrook Refrigerator."

Objected to by counsel for the complainant as incompetent, irrelevant and immaterial.

Q. 18. You have stated in your testimony that the Hambrook refrigerators were not a success. Will you please to state in what consisted the defect in the Hambrook refrigerator?

A. There was a constant dripping of water into the provision chamber. The water would drop off those troughs that caught the drippings from the ice, and also from the catch-basin in the end of the ice-chamber from which the drain pipe led. They would fill up with ice-water, and the warm air in the provision chamber coming in contact with that cold metal, would condense and drop off into the provision chamber, which made the refrigerator wet, it would swell up out of shape, would be mouldy and musty, and render it entirely useless.

Q. 19. I now show you a copy of the R. T. Hambrook patent and ask you to point out the letters which designate the troughs and catch-pan which caused the drip, and to which you referred in your last answer?

A. The troughs are marked Z Z and this catch-basin is marked S S.

Q. 20. You may state in what respect the refrigerator manufactured by the Belding Co. from your design differed from the Hambrook refrigerator, and may also explain the reason for making the changes?

A. The Hambrook refrigerator has a double-inclined bottom to their ice-chamber, with a large opening for the cold air to pass into the provision chamber. It had these troughs marked Z Z in the drawings, and the catch-basin before referred to, while the refrigerator that we built at Belding discarded the double-inclined bottom to
the ice-chamber, and substituted a single ice-bottom put in
412 square, with a smaller opening for the cold air to pass into the provision chamber, discarding entirely these troughs, the catch-basin, and discharging the drip from the ice on the back side of the refrigerator instead of the front, as is done in the Hambrook refrigerator. My reasons for making these changes were, first, that the Hambrook refrigerator as manufactured under the Hambrook patent had proved a total failure, while I knew that the refrigerators manufactured with a single bottom to the ice-chamber, and put in square, were a success, and I had sold thousands of them for the Alaska Co. Another reason was that the smaller opening from the ice-chamber into the provision chamber would hold the air in the ice-chamber in contact with the ice, and discharge it slowly into the provision chamber, colder and freer from moisture than it did in the Hambrook refrigerator where the opening was large, allowing a larger circulation of air into the provision chamber, I believing that the slower circulation was the best, and it has proved to be so.

Q. 21. In your refrigerator what was substituted in the place of the open ice-rack which had been used in the Hambrook refrigerator?

A. I put in a solid galvanized-iron ice-rack without any opening, extending from the front to the back of the ice-chamber, and from one end of the ice-chamber to the other, with the exception of about an inch and a half which was left for the passage of the air from the ice-chamber into the provision chamber.

Q. 22. What change, if any, was made in reference to the discharge pipe for waste water?

A. In the Hambrook refrigerator the discharge pipe was in the front of the refrigerator, between the doors, while in the refrigerator that we made at Belding it was at the back side of the refrigerator in the center.

Q. 23. Was there any difficulty in the construction of the Hambrook refrigerator with reference to its strength?

A. I never knew of any; never heard any complaint on that point.

413 Q. 24. What do you know about the sale by the Belding Co. of a quantity of refrigerators to the Simmons Hardware Co. of St. Louis, Mo.?

A. I know we sold the Simmons Hardware Co. refrigerators, but do not know just how many we sold. My first order I think was for three hundred and fifty refrigerators, or nearly that; somewhere near that. Those I sold, I believe, in the fall of 1886, and they

afterwards ordered goods as they needed them from the office direct. They purchased a large number of our refrigerators.

Q. 25. You may state if you know whether the refrigerators sold to the Simmons Hardware Co. contained any mark or marks to indicate that they were manufactured under a patent.

A. They did not to my knowledge.

Q. 26. Please to state whether or not the refrigerators sold to the Simmons Hardware Co. had a special name, and if so what was that name?

A. They did; they were called the I. C.

Q. 27. You may state whether to your knowledge it was claimed by the managers of the Belding M'f'g Co. that the refrigerators which were manufactured from your design were made under or in accordance with the Hambrook patent.

A. They were not to my knowledge. On the other hand it was distinctly understood that we were not to make the Hambrook refrigerators, and we never did make one.

Q. 28. What was the object or purpose of the deflecting plate marked K in the Hambrook refrigerator? And why did you make the change from the form shown in the Hambrook patent when you designed the refrigerator for the Belding Co.?

A. This plate or curved piece of metal marked K was to prevent the drippings from the ice falling into the provision chamber. The ice-rack in the Hambrook refrigerator was an open wooden
414 rack, and they had to put that plate in there to prevent the water from the melting ice falling directly into the provision chamber. The Belding refrigerator having a solid galvanized-iron ice-rack did not need that plate over there to prevent the water dripping through into the provision chamber, consequently we throwed it away as being useless. That is the only purpose that plate is put in there for, is simply to prevent the water dripping from the ice. In our ice-rack, being made of metal, and a whole sheet open at each end for the passage of the air, the air would pass around underneath this ice-rack, and condense on the under surface, the whole length of that metal rack. Now I put a narrow sheet of zinc on the under side of this ice-rack wider than the opening in the bottom of the ice-chamber, and extending from the back to the front, covering this whole cold air opening, the object of which was to prevent the condensation on the under side of this ice-rack at that particular point. Now in the Hambrook refrigerator, the rack being of wood and open, there was no condensation on the under side of their rack, consequently the only purpose this deflector plate could serve would be to prevent the water from the melting ice dropping directly into the provision chamber.

Q. 29. You may state whether or not the form of your zinc strip, as you call it, was curved like the Hambrook plate.

A. It was not. It was perfectly flat, and nailed onto the wooden rack that held the corrugated iron, while the Hambrook curved plate was fastened to his refrigerator ice-chamber at both ends. Mine was a part of the ice-rack.

(Adjourned to 2 p. m.)

(Met pursuant to adjournment.)

Q. 30. You may state whether or not the Alaska refrigerators which you sold contained a zinc strip beneath the ice support and above the opening from the ice-chamber into the provision chamber, and if so, how such strip compared with the strip which you applied to the Belding refrigerator.

415 A. It did have just such a strip as that, and it was identically the same, and put on in the same manner.

Q. 31. How long before you built the refrigerator for the Belding Co. from your design in 1884, was it that you saw this zinc strip applied to the Alaska refrigerator?

A. They used that zinc strip in the Alaska refrigerator all the time that I was with them. I don't remember having seen another used. I know I sold thousands of refrigerators with that in for the Alaska Company. That is where I first saw that, in the Alaska refrigerator.

Q. 32. What can you say as to whether the Alaska refrigerator, constructed in accordance with the Smith patent, was popular or otherwise?

Objected to as immaterial by counsel for complainant.

A. It was very popular; it was considered the best refrigerator built when I was with them. I expect it had the largest sale of any refrigerator that I know of, and it still has a very large sale.

Q. 33. What opportunities did you have for knowing about the business and management of the Belding Refrigerator Company during the time you were in its employ?

A. I was a stockholder in the company and had a right to know.

Q. 34. You may state whether or not the various makes of household refrigerators which have been built and put upon the market for the last ten or eleven years have differed in size and outward appearance.

A. There is a great similarity in the appearance of these refrigerators, both in size and appearance; their shape is also similar. They vary sometimes according to the taste of the manufacturers in the style or design of their moulding. Sometimes in the number of panels they put in the case, and sometimes in the carving they put on the case, but the general appearance of these refrigerators is similar, especially where they are made of hard wood. I have often seen refrigerators and ice chests standing in the store that I

416 could not tell who made them till I found the plate upon them, they resembled each other so much.

Q. 35. You may state whether or not the Belding Co. ever placed a mark upon their refrigerators which would show that they were patented, and if so when such mark was first introduced and in what manner it was applied?

A. They did place a mark on their refrigerators, but it was after the first year's output had been placed on the market. During my first three months with that company they never marked a re-

frigerator with a patent mark, neither were any of the refrigerators manufactured the first year marked patented.

Cross-examination by Mr. BROWN:

C. Q. 36. When you left the employ of the Smith, or as it was afterwards called, the Alaska Co., did you go at once into the employ of the R. T. Hambrook M'f'g Co. at Chicago?

A. Yes, sir; that was the next place I worked. There was a space of probably ten days from the time of my leaving the Alaska Co. and my commencing with the Hambrook Co. I left the Alaska Co. the last day of June, 1881, and commenced—my salary was commenced in the Hambrook Co. the first day of July, 1881.

C. Q. 37. Where was the office or factory of the Hambrook Co. located at this time?

A. The factory was in the Springer building on the west side, Canal street, in the third story, and the office was in the first building south of the factory, the numbers I have forgotten.

C. Q. 38. Where was the office and factory of the Booth & Osgood Co.?

A. At the same place.

C. Q. 39. How long after you began to work for the Hambrook Co. that the Booth & Osgood Co., its successor, went into the hands of a receiver?

A. I don't know.

C. Q. 40. State your best recollection.

417 A. I think it was about two years; I couldn't state positively about that.

C. Q. 41. What refrigerator was being made by the Booth & Osgood Co. or by the receiver of that company during your connection with that company?

A. I expect they called it the Hambrook patent.

C. Q. 42. State if you know when the Belding M'f'g Co. was organized.

A. I don't know the exact date, but I think it was some time in 1884.

C. Q. 43. Give the date as near as you can when you went to work for the Belding M'f'g Co.

A. I went to Belding the 23d day of Sept., 1884, but I am unable to say whether the company was organized at that time or not, but my impression is that it was. I supposed when I went there that I went to work for the Belding M'f'g Co.

C. Q. 44. How long prior to Sept. 23, 1884, was the Belding M'f'g Co.'s factory located at Belding, if you know?

A. I don't know whether the Belding M'f'g Co. owned that factory at that time or not.

C. Q. 45. State whether or not the Booth & Osgood M'f'g Co. ever located its factory other than on Canal street in Chicago as you have testified, and if so state the location, if you know.

A. I never knew of their having any other factory in Chicago.

C. Q. 46. If you know of said company ever having a factory at

any other place or places than the city of Chicago, state fully your knowledge on that subject.

A. I think they operated that factory at Belding.

C. Q. 47. Give the date as near as you can when the change was made in the location of the factory from Chicago to Belding.

A. I did not know it was ever changed from Chicago to Belding. My understanding is that they operated both places.

418 C. Q. 48. Give the date as near as you can when the factory at Belding, Mich., was opened.

A. I don't know anything about it; it was opened before I went to work for Hambrook.

C. Q. 49. Then your answer to cross-question 37 was not the whole truth, was it?

A. I shall not admit that it was a falsehood.

C. Q 50. About how many refrigerators did you sell when in the employ of the Hambrook Co.?

A. It is impossible for me to answer that question.

C. Q. 51. State approximately your best recollection?

A. I cannot answer that question.

C. Q. 52. And for what reason?

A. I cannot remember. I have no books or accounts to refresh my memory from.

C Q. 53. As I understand your testimony you were connected with the Hambrook Co. for about two years, more or less, from July 1, 1881. Do you mean the court to understand that you now have no recollection, definite or otherwise, as to the number of Hambrook refrigerators which you sold during that period?

A. Yes, sir.

C. Q. 54. State as nearly as you can the number of Hambrook refrigerators sold by the Hambrook Co. during this period.

A. I never had any means of knowing how many refrigerators they manufactured or sold, as I never kept any record.

C. Q. 55. During the period above referred to what were your duties as an employé of the Hambrook Co.?

A. A traveling salesman.

C. Q. 56. What were your duties in connection with your employment by the Smith or Alaska Co. prior to July, 1881?

A. I was employed as a traveling salesman by the Smith Co.

C. Q. 57. Mr. Hotchkiss, are you or have you ever been a draftsman?

419 A. No, sir.

C. Q. 58. State again the date when the change was made in the refrigerators of the complainant from the Hambrook refrigerator to the present style.

A. The present style of refrigerators were built for the first time to my knowledge when they started up that factory at Belding for the Belding M'f'g Co.

C. Q. 59. And what was the date?

A. I don't know the date when the factory first started to run, as the machinery was running when I got there, the 23d day of September, but they had not built any refrigerators yet.

C. Q. 60. How soon after you arrived at Belding in Sept., 1884, did you begin to change the construction of the refrigerators?

A. We did not change any construction. We never made any refrigerator except that one kind when I was there.

C. Q. 61. State again what kind that was.

A. It was known as the "New Perfection."

C. Q. 62. What drawings did you make from which these refrigerators were built?

A. I did not make the drawings myself. The foreman that was at work for Mr. Stanton, the receiver on Canal street, made these drawings for me. I did not make them as I did not know how. He made them under my direction.

C. Q. 63. Do you remember the name of the foreman?

A. I do not

C. Q. 64. State what your duties were at Belding during the three months following Sept., 1884.

A. My duties were to be in that shop every day and see that those refrigerators were made just as I wanted them.

C. Q. 65. Who was the foreman of the factory at Belding during this period?

420 A. It had three foremen in the factory at that time, besides a superintendent.

C. Q. 66. Give the name of the superintendent, and also the names of any of the foremen you know.

A. Fred. Ranney was superintendent; a man by the name of Myron Blodgett acted as superintendent of the machine department, a man by the name of John Martin was superintendent of the zincing department. I don't remember that we had any foreman in the cabinet department.

C. Q. 67. State whether or not John Lewis was employed in the factory at Belding at that time.

A. Yes, sir; they had a man by that name there. He was bookkeeper.

C. Q. 68. Prior to your employment by the Belding M'f'g Co. with whom did you make the arrangement or agreement of which you have testified?

A. W. A. Stanton.

C. Q. 69. When did you make this agreement?

A. I cannot tell the date.

C. Q. 70. Give it as near as you can.

A. Somewhere near the 1st of September. I cannot give the exact date.

C. Q. 71. Of what year?

A. 1884.

C. Q. 72. Was that in writing?

A. No, sir.

C. Q. 73. Have you stated the entire agreement?

A. I don't remember whether there was anything else said at the time or not; there was no one else present except Mr. Stanton and myself. I don't remember anything else.

C. Q. 74. Were not your duties specified by that agreement?

A. No, I don't know that they were. It was understood between us that I was to sell those goods on the road.

421 C. Q. 75. When did you become a stockholder in the Belding M'f'g Co.?

A. I think it was in the year 1885, possibly a little later than that.

C. Q. 76. Are you a stockholder now?

A. No, sir.

C. Q. 77. After the three months following Sept., 1884, during which time you were at the factory, what were your duties in connection with the Belding M'f'g Co.?

A. Traveling salesman.

C. Q. 78. State whether or not during your connection with the Smith M'f'g Co., the Hambrook M'f'g Co. and its successor and the Belding M'f'g Co., it was your custom as traveling salesman to be on the road in pursuit of your business as traveling salesman during the entire year.

A. No, sir.

C. Q. 79. During your employment by the Belding Co. were you sent to the factory at Belding at any other time than the fall of 1884?

A. I was sent over there once or twice on some little minor thing, but I don't remember what it was. I never went there unless I was sent there.

C. Q. 80. With whom did you have the understanding "that we were not to manufacture the Hambrook refrigerator" at Belding in 1884, as you have testified?

A. W. A. Stanton was the final arrangement made.

C. Q. 81. At what time did you have this understanding with him?

A. As I told you before, I could not fix the date. It was somewhere near Sept. 1, 1884, as near as I can recollect, and I would not be positive about that even.

C. Q. 82. Was it at the time that you made your agreement with him regarding your employment by the Belding M'f'g Co.?

A. Yes.

422 C. Q. 83. Did you ever have any other agreement or understanding with Mr. Stanton or other officer of the Belding Co. relating in any way to your employment by said company?

A. I don't remember of any other. I never had any written agreement with them as to the amount of salary I was to receive, or as to how long I was to work. I did not consider it necessary. I never knew of his having a written agreement with any one in relation to their services.

C. Q. 84. About how many refrigerators were manufactured complete at Belding during the three months in 1884 that you were at the factory?

A. I don't know; I never did know how many, and don't suppoie any one else knows.

C. Q. 85. Was the factory running with a full force and on full time during this three months?

A. I do not know what you would call a full force. We were not running to our fullest capacity. We were running on full time. Starting up a factory like that, we could not run it at its fullest capacity. During the latter period of my stay at Belding we had things running in good order.

C. Q. 86. Towards the end of that period about how many per day were being manufactured?

A. That is a question that no man on earth could answer. I don't know.

C. Q. 87. And you can give the court then no approximate idea as to *now* many refrigerators were made at the Belding factory under your personal supervision during the three months following Sept. 23, 1884?

A. No, sir, no reliable information.

C. Q. 88. Would the number be more than five hundred, or less?

A. I don't know.

C. Q 89. Did you examine personally each of the refrigerators made during that period after the same were severally completed and ready for sale?

A. I was expected to do so, and during the construction also.

423 Answer objected to as not responsive, and the question is repeated.

A. I tried to examine them all, and expect I did. If any got away from me I did not know it. I was absent some during that time for a day or two at a time, and during my absence they might have finished some refrigerators that I did not see and inspect personally after they were finished.

C. Q. 90. After the refrigerators were finished and varnished, what next was done with them?

A. They were sent to the crating-room to be crated, and then to the warehouse to remain until shipped.

C. Q. 91. Did you inspect personally any of those refrigerators between the time when they were varnished and the time they were crated?

A. Yes, sir.

C. Q. 92. Did you inspect them all during that period?

A. I tried to. As I said before, some of them might have been crated during my absence.

C. Q. 93. State whether or not any of the refrigerators manufactured during your stay with the factory were also sold during that period?

A. I don't know of any that were sold.

C. Q. 94. Have you personally inspected any refrigerators made by the Belding Co. other than those made during the period above referred to, for the purpose of ascertaining whether or not any patent marks were placed on the same?

A. Yes, sir.

C. Q. 95. State, if you know, when the complainant's refrigerators were first marked patented?

A. It was, as near as I can recollect, some time in 1885, I believe, as near as I can remember. I know the matter was talked of in our office in Chicago about our having a right to put a patent mark on our refrigerators after we had found that other people were manufacturing refrigerators similar to ours, and I had always
424 claimed that we had no right to mark our refrigerators patented, as this particular refrigerator had never been patented, or any part of it that I knew of, not in its present state. It was made up from other refrigerators and we had no right to a patent.

C. Q. 96. To whom do you refer in your last answer, wherein you say "after we had found that other people were manufacturing refrigerators similar to ours"?

A. Mr. Stanton, Mr. Belding and myself.

C. Q. 97. To whom did you refer that answer by the words "other people"?

A. More particularly to the Challenge Corn Planter Co.

C. Q. 98. How long before this conversation between yourself, Mr. Stanton and Mr. Belding had these other people been so manufacturing refrigerators similar to the Belding Co.'s refrigerator?

A. I could not answer that question. I do not know.

C. Q. 99. About what time in the year 1885 did this conversation take place?

A. I think it was in the fall, when we were getting up our catalogue.

C. Q. 100. How did you know at that time that others were manufacturing refrigerators similar to the Belding refrigerator? Were these other refrigerators sold on the market at or prior to this time?

A. Yes. I had met them on the road; seen them in stores. I can't state where, but I had seen those goods. They were manufactured by the Challenge Corn Planter Co.

C. Q. 101. Give me the date, if you can, of the first sale of the Belding refrigerators to the Simmons Hardware Co.?

A. I cannot give the date.

C. Q. 102. You made that sale did you not?

A. Yes, I did.

C. Q. 103. Why can you not be more positive as to the date when you made this sale to the Simmons Co.?

425 A. Because it is impossible for me to remember dates unless I have some memorandum. I have a poor memory. I cannot remember dates.

C. Q. 104. What memorandum have you got which did enable you to fix any of the dates referred to to-day by you in your testimony?

A. As far as the 23d day of September, 1884, was the day I went to Belding, which date I fixed by an expense account that I had against the Belding Co.

C. Q. 105. Have you any other memorandum by which you have fixed any other date in your testimony to-day?

A. I don't remember.

C. Q. 106. Then aside from this date, September 23, 1884, the dates you have given, as well as the rest of your testimony, is simply your best recollection, is it?

A. Yes, sir.

C. Q. 107. During your connection with the Smith M'f'g Co. was the refrigerator manufactured by it, manufactured under the Smith patent of July 24, 1877?

A. It was.

C. Q. 108. Were the refrigerators manufactured then similar in construction and mode of operation to that shown in the drawing of the Smith patent here in evidence and before you now?

A. They were similar in their construction, but not exactly alike.

C. Q. 109. What differences were there between the drawings of the Smith patent and the refrigerators manufactured by the Smith Co.?

A. The difference was in the ice-table. As shown in this drawing it is a wooden table or ice-rack covered with zinc, with a solid piece of wood over the cold-air flue, while in the refrigerators manufactured by the Smith Co., while I was with them, there was a corrugated iron rack or ice-table with a piece of zinc on the under side of the rack to cover the cold-air flue; otherwise they were the same.

426 C. Q. 110. How wide and how long was the central opening in the bottom of the ice-chamber of the Hambrook refrigerators that were sold by you? I refer to the opening which permits the downward passage of cold air into the provision chamber or chambers.

A. I should judge that those openings were about two inches wide from the edge of the trough to the center partition on each side, and extending from the front to the back of the ice-chamber, with the exceptions of the width of the catch-basin marked S S in the drawings.

C. Q. 111. In a corresponding size of the present style of refrigerator as made by the Belding M'f'g Co. what would be the size of that opening? Do you know?

A. I don't know exactly how large they are made, but my impression is they are about two inches and a half, from two to two and a half. The length would be about the same.

C. Q. 112. State the time when you left the employ of the Belding M'f'g Co. and whether or not you were discharged from its employ.

A. I was not discharged. I left their employ I think the 1st of May, 1888. When I told Mr. Belding that I calculated to leave his employ and what I was going to do, he told me to take a lay-off until the first of May, and then if I did not complete my arrangements to come back; but I knew that I did not have to leave unless

I wanted to. When the first of May came around I told him I would quit for good, and we parted the very best of friends.

C. Q. 113. Will you state positively that the change from the Hambrook refrigerator to the present style was not made prior to the fall of 1884?

A. Prior to the fall of 1884, while Mr. Stanton was receiver for the Booth & Osgood M'f'g Co., I asked him to give me two men in his factory to be placed at my disposal, to manufacture a refrigerator, as I wanted a nice refrigerator to send to one of my customers in Cincinnati, who was to exhibit it at the exposition there. He gave me an order to the foreman in the factory to place two
427 men at my disposal, and I went to work and manufactured one single refrigerator exactly like what is now the "New Perfection," manufactured by the Belding Co., and it was sent to Cincinnati and exhibited at the exposition, and the drawings that refrigerator was made from are the drawings from which the present refrigerator of the Belding Co. is made. It was the first one I ever saw built in that factory. The internal arrangements were exactly the same as the refrigerator made at Belding now.

GEO. R. HOTCHKISS.

(Adjourned until Wednesday, Dec. 18, 1889, 10 a. m.)

WEDNESDAY, *Dec.* 10—10 a. m.

JOHN C. MARTIN, a witness produced on the part of the defendant in the original bill, and on the part of the complainant in the cross-bill, being first duly sworn to tell the truth, the whole truth, and nothing but the truth, in said cause, says in response to interrogatories propounded by Mr. TAGGART as follows:

Q. 1. State your name, age, residence and occupation.

A. I am forty-two years old, I live in Eau Claire, Wisconsin, and I am a tinsmith by occupation. My name is John C. Martin.

Q. 2. You may state what experience, if any, you have had in connection with the manufacture of refrigerators.

A. I first went to work making refrigerators in May, 1881, for the R. T. Hambrook M'f'g Co. of Chicago. I worked for them until the firm changed hands and became the Booth & Osgood. I worked for them until they failed and it went into the receiver's hands. I worked for the receiver up to the first of October, 1884. I then went to work for the Belding M'f'g Co., and since I quit them I worked for the Wisconsin Refrigerator Co. of Eau Claire, and am working for them yet.

Q. 3. You may state upon what part of the refrigerator you were engaged.

A. I was working lining.

428 Q. 4. What, if anything, do you know about a refrigerator manufactured under the direction of Mr. Geo. R. Hotchkiss at Belding, in the fall of 1884.

A. I know that I lined these refrigerators and I was instructed by Mr H. H. Belding to work under Mr. Hotchkiss' orders and do

as he told me. I had a knowledge of this refrigerator he was going to make beforehand, because we had talked the matter over.

Q. 5. Where were you residing when you were employed by Mr. H. H. Belding to go to work for the Belding M'f'g Co. under the directions of Mr. Hotchkiss?

A. I was residing at Chicago.

Q. 6. And where were you at work?

A. I was at work for the receiver of the Osgood Co. I went to work at Belding for the Belding M'f'g Co.

Q. 7. What was the style of the refrigerator manufactured by Mr. Hotchkiss for the Belding M'f'g Co. at Belding in the fall of 1884?

A. It was what we called flat-bottomed in the ice-chamber, single bottom, generally speaking like the Alaska refrigerator, only it did not have a circulating flue through the lid. It was similar to that.

Q. 8. Were these refrigerators, manufactured at Belding while you worked there, understood to have been made in accordance with the Richard T. Hambrook invention?

A. No, sir, they were not.

Q. 9. You may state, if you know, why the Belding M'f'g Co. did not manufacture the Hambrook refrigerator?

Objected to by counsel for complainant as not being the best evidence and as irrelevant, incompetent and immaterial.

A. They wanted to get a better one. The Hambrook had always proved a failure and gave no satisfaction to customers. It used to drip sweat on these troughs, and this little catch-basin between the troughs.

Q. 10. Can you point out by reference to the copy of the Hambrook patent No. 204,216, the part or parts of the Hambrook refrigerator from which the water dripped?

429 A. It used to drip from those troughs marked *z z* and from the pan marked *s s*. I have frequently been sent out to remedy it, but there was no remedy for it excepting to keep the door shut to keep the warm air out.

Q. 11. You may state in what place you were sent out to try and remedy the Hambrook refrigerators, and by whom you were sent out?

A. It was in Chicago, and I was sent out by the R. T. Hambrook M'f'g Co. and the Osgood Co.

Q 12. Were you acquainted with the construction and operation of the refrigerator patented to Geo. F. Smith July 24, 1877, and commonly called the Alaska refrigerator?

A. I was. At that time when I first went at the business I knew nothing about it, but afterwards I made a study of it and learned the difference between the different refrigerators on the market.

Q. 13. You may state, if you can, when and where you saw the first Alaska refrigerator?

A. I think the first one I saw was at Mr. Hotchkiss' house after he moved from Michigan City over to Chicago.

Q. 14. You may state whether or not to your knowledge Mr.

Geo. R. Hotchkiss designed his refrigerator built at Belding in 1884 after the plan or design of the Alaska refrigerator, and may give the reasons for your opinion or knowledge on the subject?

Last objection repeated.

A. He copied from the Alaska because it was a better refrigerator than the Hambrook. I think it was cheaper made.

Q. 15. You may state in what respects it was cheaper?

A. The zinc-lined bottom in the Hambrook refrigerator was a more difficult bottom to make, and there was a great deal more work on the lining of it.

Q. 16. You may state whether or not you had frequent conversations with Mr. Hotchkiss with reference to the good qualities of the Alaska refrigerator?

430 A. We often talked about that.

Question and answer objected to as incompetent and immaterial.

Q. 17. Did you ever hear that the Hambrook refrigerator was lacking in strength?

A. No sir, I never did.

Q. 18. State whether or not any of the Belding refrigerators manufactured at Belding in 1884 contained any mark of any kind to indicate that they were patented?

A. I don't think they did. I did not notice it if there was any.

Q. 19. You may state how long you remained with the Belding M'f'g Co. after you went to work for them in the fall of 1884?

A. I think it was the 25th of December. It was just about Christmas time.

Q. 20. State whether or not Mr. Geo. R. Hotchkiss ever constructed a refrigerator in the city of Chicago similar to or like the refrigerators manufactured by the Belding M'f'g Co. at Belding during the time you worked for the Belding Co.

A. He made one in Chicago when I was working for the receiver of the Osgood Co. He made one that went to Cincinnati to the exposition. It was exactly like the ones they were making at Belding.

Q. 21. Did you take any part in the construction of the refrigerator made by Mr. Hotchkiss for the receiver of the Booth & Osgood M'f'g Co.?

A. Yes sir, I lined it.

Q. 22. Will you state a little more definitely what you mean by lining a refrigerator?

A. I finished it up on the inside with zinc and made the racks.

Q. 23. In the Hambrook refrigerator what was the construction or form of the troughs *z z* which caused the water to flow from the rear of the refrigerator to the waste-water pipe?

431 A. They were bent in the zinc and were bent a half inch deeper in the front than in the rear in order to give it a flow to the front. In the front they were connected together by a little pan or catch basin.

Q. 24. Will you state how the Hotchkiss refrigerator constructed at Belding in 1884 differed from the Hambrook refrigerator?

A. It was deeper in the ice-box. The Hotchkiss refrigerator was a single bottom, and it was nearly flat, and consequently made a larger ice-chamber. The Hambrook had a pitch bottom toward the center. That was the principal difference between them. There was a difference in the ventilation. In the Hambrook the openings in the center were very large to allow a rapid discharge of the air from the ice-chamber. In the Hotchkiss the opening was smaller in order to regulate the flow, to make it flow more slowly, and be colder.

Q. 25. Are there any other differences you want to point out?

A. The R. T. Hambrook had an open ice-rack, wooden, and over this opening in the ice-chamber there was a little deflector soldered into the refrigerator to turn the drippings from the ice into the troughs and keep it from going down into the provision chamber. In the Hotchkiss refrigerator they had a corrugated-iron table in the place of the rack, and under this corrugated rack was nailed a strip of zinc in order to prevent sweating. That is about all the difference there was.

Q. 26. I call your attention to the method of disposing of the water, and ask you if there is any difference in that respect between the Hotchkiss refrigerator and the Hambrook refrigerator?

A. The Hotchkiss refrigerator has the water run to the back without any troughs. The Hambrook refrigerator has it run to the front. It runs to the front by means of those two troughs marked Z Z in the drawings.

Q. 27. How did the space between the double-inclined bot-
432 tom pieces in the ice-chamber and the ice-rack in the Hambrook patent compare in size with the space between the ice-table and the bottom of the ice-chamber in the Hotchkiss refrigerator?

A. It was fully double as big in the Hambrook as it was in the Hotchkiss.

Q. 28. You may state, if you know, whether the Alaska refrigerator has been heretofore and still is a popular refrigerator?

Objected to by counsel for complainant as incompetent, irrelevant and immaterial, witness not being qualified.

A. Yes, I know it to be the case. Its sales are larger than any other refrigerator in the country.

Q. 29. You may state whether or not while you were working for the Belding Co. any of the refrigerators manufactured in accordance with the Hambrook invention were ever brought back to the factory for the purpose of modification or alteration?

A. While I was there there was one brought back—I think it belonged to H. H. Belding—to be fixed over and relined, but I could not give the time.

Cross-examination by Mr. BROWN:

C. Q. 30. What information have you upon which you based your answer to question 28?

A. I was told by Mr. Bullis, president of the company, that at that time, I think 1881 or 1882, in the fall, that they were then making about eight thousand a year, and I was in Michigan City this summer and a gentlemen there told me they had sold twenty thousand this year. I also know that is the general talk.

C. Q. 31. Did the Belding M'f'g Co. ever manufacture refrigerators in Chicago?

A. No, sir.

C. Q. 32. Who was the general superintendent or manager of the Belding factory at Belding when you went to work there in 1884?

A. Fred. Ranney.

433 C. Q. 33. How long was he in that position, if you know?

A. I don't know just how long. He is there yet, I think.

C. Q. 34. How many were employed at the factory from the time you began work in October, 1884, say, until January, 1885?

A. I have no means of knowing. I couldn't tell you.

C. Q. 35. State approximately, or as near as you can.

A. I should say probably forty, fifty or sixty men.

C. Q. 36. What was your position in the factory at this time?

A. I was foreman in the lining-room.

C. Q. 37. How many men had you in this room?

A. Usually about eight or nine, sometimes ten.

C. Q. 38. In what part of the factory was your shop located?

A. We were down in the basement, facing the river.

C. Q. 39. In what part of the factory was the finishing-room?

A. There were two. One was next to us in the basement, and the other upstairs over my shop.

C. Q. 40. Were all the refrigerators passed through both of these finishing-rooms?

A. Yes, everything. They came from the cabinet-room to the finishing-room and there got the coat of filling and shellac. Then they came to us. When we were through with them they went out into a little shanty and were filled with charcoal. From there they went upstairs to the next floor and had the legs put on. From there they went to the final finishing-room. From there they went to the crating-room. From the crating-room they went to the warehouse.

C. Q. 41. Was the location of the final finishing-room and of the crating-room such that in going to and from your tin shop to your regular work you would pass through either of said rooms?

434 A. No; but I used to go through these rooms pretty nearly every day.

C. Q. 42. Did you ever have in your personal use a Hambrook refrigerator as manufactured prior to 1884?

A. I never had one of any kind in my life for my personal use.

C. Q. 43. Whereabouts in Chicago were you sent to remedy a Hambrook refrigerator?

A. That would be a difficult matter to tell now at this late day.

C. Q. 44. That is, you cannot now remember?

A. No, I never kept any track of it.

C. Q. 45. Can you give the year or the month?

A. No, it was while I was working there.

C. Q. 46. Prior to the fall of 1884, what opportunity did you have for knowing the advantages or disadvantages of the Hambrook refrigerator?

A. I had seen a great many returned, and I had a pretty good instructor in Mr. Hotchkiss. He used to post me in what I did not know about refrigerators—on all their good and bad points.

C. Q. 47. About how many refrigerators were returned?

A. I cannot tell. I have seen lots of them returned.

C. Q. 48. Do you know of your own knowledge the reason or reasons why any one of these refrigerators was returned?

A. Because they got musty and smelt strong and were damp.

C. Q. 49. How do you know those were the reasons for returning the refrigerators?

A. When one would come in they would tell us to clean it out and set it one side and get it to smelling sweet. It was generally Mr. Sheridan or Mr. Lewis.

C. Q. 50. From May of 1881 up to October, 1884, how
435 many refrigerators were manufactured by the Hambrook Company, the Booth & Osgood Co., and Mr. Stanton the receiver?

A. I could not tell the exact number. I should not think there had been more than eight or ten thousand.

C. Q. 51. When and where did Mr. Belding give you the instructions to go to work at the factory at Belding under Mr. Hotchkiss?

A. It was in Belding's office in Chicago. I got my final instructions the day before I left.

C. Q. 52. Have you stated all your instructions?

A. Yes, sir, I think so.

C. Q. 53. How long did you work under Mr. Hotchkiss' directions at Belding.

A. About two or three months.

C. Q. 54. When you arrived at Belding in the fall of 1884, what instructions did Mr. Hotchkiss give you?

A. He told me to keep my eyes open and see that things were done as they ought to be, and that I was to have the lining done the best in the market. They proposed to put out the best refrigerator that was made.

C. Q. 56. What instructions or information did you get from Mr. Hotchkiss regarding the construction of the refrigerators?

A. I was told by him to line it in the best way possible, and that I was to put in tin provision racks and a galvanized-iron ice-table.

C. Q. 56. How did you know what shape or form to construct the refrigerators in?

A. I had done one or two before coming to Belding.

C. Q. 57. Where and under whose instruction?

A. In the Booth & Osgood shop when it was in the receiver's hands and under Mr. Hotchkiss' directions.

C. Q. 58. Do you know whether or not you made this refrigerator at Chicago from any drawing which Mr. Hotchkiss made or had?

A. I believe it was made from a drawing.

C. Q. 59. But you are not certain, are you?

436 A. No, I am not certain. It must have been made from a drawing.

C. Q. 60. Do you know what afterwards became of this refrigerator which was sent to the Cincinnati exposition?

A. No, I do not.

C. Q. 61. How was the weight of the ice sustained in the original Hambrook refrigerator?

A. By an open ice-rack that covered the bottom of the refrigerator. That was supported on a rib that was bent on each side from end to end, that is back and front.

C. Q. 62. The rib was bent in from the tin lining, was it?

A. Yes, from the tin lining.

C. Q. 63. How large were the openings in the center of the Hambrook refrigerator?

A. If I recollect right they were about two inches and a half on each side. I think in the big ones they made them wider.

C. Q. 64. And in a relative size of the refrigerators manufactured in 1884 at Belding what was the size of the opening in the ice-chamber?

A. I think they were about three inches, or three and a half. That covered both openings.

C. Q. 65. How was the deflecting plate in the original Hambrook refrigerators secured to the bottom of the ice-rack?

A. It was not secured to the ice-rack at all. It was soldered onto the back of the refrigerator and onto the edge of the little pan in front.

C. Q. 66. And the ice-rack set down over it, did it?

A. Yes.

C. Q. 67. What refrigerator are you now engaged in manufacturing?

A. The Peerless. It is made by the Wisconsin Refrigerator Co. at Eau Claire.

C. Q. 68. This is similar to the Alaska refrigerator in construction, is it not?

A. Yes, sir.

437 C. Q. 69. Do you know whether or not the Wisconsin Refrigerator Co. has been sued by the Alaska Co. at Chicago, Ill., for an infringement of the Geo. F. Smith patent?

A. I never heard they were.

C. Q. 70. Is Mr. Geo. R. Hotchkiss still connected with the Wisconsin Refrigerator Co.?

A. I don't think he is. He might be.

C. Q. 71. During your connection with this company has it manufactured any other construction of refrigerator than the Peerless?

A. No.

C. Q. 72. State what kind of an ice-rack the Alaska refrigerator has.

A. They have a corrugated-iron rack or table, nailed usually on three supports, with a strip of zinc beneath and over the opening, to prevent condensation.

C. Q. 73. Can you swear from your own knowledge that the refrigerators manufactured at Belding in 1884 did not contain any mark to indicate that they were patented?

A. I never saw any on, and I think if there had been any on I would have noticed it.

C. Q. 74. That is not a direct answer to my question. The question was not whether or not you noticed any such marks, but whether from your actual knowledge you will swear that those refrigerators were not so marked.

A. I will not swear that they were not nor I will not swear that they were. I never noticed them; it is out of my line.

C. Q. 75. State again when you left the employ of the Belding M'f'g Co.

A. I left it just before Christmas in 1885; I think it was the 20th of December.

C. Q. 76. Did you have any trouble or fuss with Mr. Ranney or other officer of the company?

A. No.

JOHN C. MARTIN.

(Adjourned to 2 p. m.)

438 (WEDNESDAY, *Dec.* 18—2 p. m.)

ARTHUR W. RANNEY, a witness on behalf of the defendant in the original bill and the complainant in the cross-bill, being first duly sworn to tell the truth, the whole truth and nothing but the truth in said cause, says in answer to interrogatories propounded by Mr. TAGGART as follows:

Q. 1. State your name, age, residence and occupation?

A. My name is Arthur W. Ranney, occupation jobber and builder, I am thirty-nine years old, residence Kalamazoo, Mich.

Q. 2. You may state what experience you have had, if any, in connection with the manufacture of refrigerators?

A. My first experience was while at work for the R. T. Hambrook School Furniture M'f'g Co., Mr. Joseph Hambrook having a sample of drawings sent to him from Chicago for the Hambrook patent refrigerator. I assisted and helped in making the first refrigerator made of that patent as far as my knowledge is concerned, which was made in Belding, where their school furniture factory was then located. I had no other connection with it until Mr. F. E. Ranney came after me in July, 1884, when he hired me as a foreman to go to Belding and take charge of the shop to make refrigerators. After getting to Belding and finding out that Mr. H. H. Belding in the meantime had hired another foreman in Chicago, and then I went to work to put the machinery in order for the purpose of manufacturing refrigerators as I understood it. Then in about the last of October or first of November, Mr. F. E. Ranney, becoming dissatisfied with the present foreman, came to me and said, "I wish you had the run of the shop so as to take the foremanship of it." And this was on a Thursday, and the following Monday Mr. John Lewis came to me in the shop and presented me

with the cutting bills of the shop and said that I was to take the foremanship of the shop, in which I continued until December, 1886.

439 Q. 3. You state that you manufactured or assisted in the manufacture of a refrigerator after the R. T. Hambrook patent in 1878 or 1879?

A. Yes sir, it was. I was a workman in the shop and Mr. Joseph T. Hambrook had me assist him in making a sample refrigerator to send to Chicago as a sample. After that time I worked a short time in making refrigerators in the knock-down to ship to Chicago there to be finished.

Q. You may state whether or not the Belding Co. manufactured the Hambrook refrigerator during the years 1884, 1885 or 1886?

A. No sir, they did not.

Q. 5. What kind or style of refrigerators did the Belding M'f'g Co. manufacture while you were at work for said company?

A. The style of the refrigerator was a single, straight bottom in ice-chamber, with an incline from the front to the back of the refrigerator, with a drip-pipe in the back, the cold-air discharge in the center of the refrigerator.

Q. 6. You may state, if you know, who introduced the style of refrigerator manufactured by the Belding Co. in 1884 and afterward?

A. It was introduced, as I understood it, and as I had my instructions at the machine shop, to make them just as Mr. Geo. R. Hotchkiss ordered, I being told by Mr. Fred. E. Ranney that Mr. Geo. R. Hotchkiss was sent over there to see about making them and to make them as he wanted them.

Q. 7. Will you please describe the difference in construction between the Hambrook refrigerator which you assisted in building and the refrigerator constructed by the Belding Co. in 1884 and since?

A. The R. T. Hambrook M'f'g Co. manufactured the ice-bottom with an inclined plane extending from each end towards the center, with an oval deflecting plate over the center discharge in the ice-chamber with two troughs, one each side, with a box or trap

440 in front leading to the drip-pipe, which was at the front. The Belding M'f'g Co. manufactured a straight, solid, ice-bottom, extending from front to back, with the drip-pipe at the back side.

Q. 8. Explain how the water passed from the melting ice in the Hambrook patent to the drip-pipe.

A. The Hambrook patent had an open ice-rack, and the drip from the ice passed down upon this oval deflecting plate, which was wide enough to carry over into the troughs, which were on each side, and thence carried to the front part by the tipping part of the ice bottom. There was a half an inch hitch from front to back which was varied by the process of tinning or zincing, the zinc being cut and bent to give it about a half an inch pitch towards the front.

Q. 9. Please explain how the water passed from the melting ice to the waste pipe in the Hotchkiss refrigerator.

A. The ice table or rack was built solid with an open space at each end from which the drip of the ice was carried off on that solid table or rack, and it was on an incline of about a half an inch towards the back side, which carried the drip that way. The ice-chamber bottom being on an incline of the same (half an inch) also carried it back to the waste pipe.

Q. 10. How near did the inclined bottom pieces of the Hambrook refrigerator approach to each other?

A. That varied in the different sizes of refrigerators. I could not say as to the entire distance. I know they were much larger than the present manufacture of the Belding Co.

Q. 11. I think you mistook the meaning of my question. I did not intend to call for the relative sizes of the center opening from the ice-chamber to the provision chamber, but intended to inquire for the approximate distance apart of the so-called double-inclined bottom pieces shown by X and Y in the Hambrook patent.

A. I could not give the definite space between those, because there was only one that I ever made. I don't remember as ever having measured them.

441 Q. 12. You may state whether or not it was understood that Mr. Hotchkiss was to make a Hambrook refrigerator.

A. I don't know what the understanding was as to what refrigerator he was to make. I was told to follow Mr. Geo. Hotchkiss' instructions and make a refrigerator according to his instructions, as Mr. Fred. E. Ranney informed me that Mr. Hotchkiss was making a refrigerator and taking charge of the manufacture, and was to make them as he wished.

Q. 13. You may state, if you know, what defects were found in the Hambrook refrigerator?

A. They were said to have sweat or condensed under the deflecting plate, and dripped from there into the provision chamber, which caused them to be damp and moist and considered as no good on account of the moisture.

Q. 14. State whether or not there was any lack of strength or durability in the Hambrook refrigerator as originally constructed?

A. None that I ever heard of. All that I ever heard of was on account of their sweating and dripping into the provision chamber.

Q. 15. Did the refrigerators manufactured by the Belding Co. in 1884 contain any letters or marks of any kind to indicate that they were patented?

A. No, sir, they did not.

Q. 16. Were the refrigerators made at Belding by the Belding M'f'g Co in 1884 stencilled or marked in any way?

A. Yes, sir, they were stencilled first with the number of the refrigerator and then the name "(New Perfection), manufactured by the Belding M'f'g Co., Belding, Mich." That was all there was on it. The number was a separate stencil by itself on the refrigerator.

Q. 17. When did the Belding M'f'g Co. first begin to mark the refrigerators to indicate that they were patented?

442 A. It was soon after they put in their new engine and boilers at starting for the manufacture of refrigerators in 1885. I think it was in October; about that time.

Q. 18. Do you remember the circumstances which called your attention to this patent mark?

A. Yes, sir, I do. It was called to my attention by one of the packers who asked me what was the patent on the refrigerators. I made him some vague reply, passed on, and said nothing more about it. I turned and started to go upstairs in the machine shop, and at the head of the stairs I met Mr. F. E. Ranney. I said to Mr. Ranney, "I see you have your new stencil." He said yes. I said, "Where is the patent on your refrigerator? I see you have a patent stenciled." He made me the reply that it was on the circulation, and passed on, and there was no more conversation about it.

Q. 19. Are you able to state from recollection the words and figures which indicated the patent?

A. Yes, sir. The new stencil read, "New Perfection, manufactured by the Belding M'f'g Co., Belding, Mich., patented May 28, 1878."

Q. 20. Were the words "New Perfection, manufactured by the Belding M'f'g Co., Belding, Mich.," and the words "patented May 28, 1878," all on a single stencil plate?

A. Yes, sir, they were.

Q. 21. You may state whether or not you ever assisted in stenciling these refrigerators.

A. Yes, sir, I have helped stencil them a number of times, as the packers were very often crowded; I have taken hold and helped them out, and we very often worked after hours at night, and I have been there to assist them stencil the refrigerators, clean them up, and assist at packing.

Q. 22. Did you assist in stenciling with both kinds of stencil plate, that is, the one which did not contain the words indicating the patent, and the one which did contain the words indicating the patent?

443 A. Yes, sir, I did. Furthermore, as assistant superintendent or foreman it was my business to see that the stencil was put on.

Q. 23. At what time in the process of the manufacture of the refrigerators was the stenciling done?

A. It was done at the time of packing or crating.

Q. 24. State whether or not you ever changed over any of the refrigerators constructed in accordance with the R. T. Hambrook patent into the form of refrigerator introduced by Mr. Hotchkiss, and if you made such change or changes, state when, where and for whom.

Objected to by counsel for complainant as immaterial, irrelevant and incompetent.

A. Yes, sir, I changed one of the old Hambrook patent over to the Belding M'f'g Co.'s present style for Mr. D. E. Wilson of Belding. I took out the old ice-bottom, which was a double-inclined

bottom, (inclined from each end towards the center,) and put in a Belding M'f'g Co.'s ice-bottom which they were manufacturing at that time. I tore out the old bottom and put in the new bottom under my personal supervision.

Q. 25. Describe a little more fully the new bottom which you put in, and also what you put in place of the ice-rack.

A. I put in their single bottom, with pitch from front to back, with an incline of about a half inch, and changed the drip-pipe to the back side; and in place of the old original ice-rack I put in the solid ice rack or table which they now manufacture or did at that time.

Cross-examination by Mr. BROWN:

C. Q. 26. When did you first go to work for the R. T. Hambrook School Furniture M'f'g Co., and where?

A. When I first commenced work for the R. T. Hambrook School Furniture M'f'g Co. I couldn't say, but the building, the old original building that stands there, I helped to put up, as a day laborer, and when Mr. Joseph T. Hambrook came over there to take charge
444 of R. T. Hambrook's business I still continued to work on with them. I helped them put in their engine and boilers, and worked at the bench on school furniture, smoothing and cleaning up, and also packing and shipping, in Belding.

C. Q. 27. When did you quit the employ of this company?

A. I couldn't say as to that, as I have quit them twice and went to work for them afterwards.

C. Q. 28. Is Mr. Fred. E. Ranney related to you in any way, and how?

A. Yes, sir, Mr. Fred. E. Ranney is second cousin to me.

C. Q. 29. Where were you living in 1884, between July and Nov. 1?

A. I was living in Big Rapids, Mich.

C. Q. 30. Were you living there when Mr. Ranney hired you in 1884?

A. Yes, sir.

C. Q. 31. What shop did Mr. Ranney engage you to take charge of?

A. The conversation that Mr. F. E. Ranney and I had in Big Rapids was to this effect: That they were going to start the factory there in Belding, and they had put him in to see to it, and he furthermore said, I think, that I should become the superintendent of the institution, and he says, "Will you come down and go to work for me?" I told him that I would. There was no price set for what I should come for. That was about all the conversation at that time. It was in the latter part of July, 1884. He furthermore says that "when I go back to Belding I will let you know within a few days." That was all the conversation we had at that time.

C. Q. 32. How soon after that conversation did you go to Belden?

A. It was within three or four days.

C. Q. 33. What shop did you afterwards take charge of on the orders of Mr. Lewis?

445 A. I took charge of the Belden M'f'g Co.'s shop at Belding.

C. Q. 34. In what capacity?

A. As general foreman or assistant superintendent.

C. Q. 35. What do you mean by cutting bills?

A. The cutting bills of the shop are the bills for cutting the refrigerators or pieces for them from the lumber as it is shipped in from the cars after being surfaced on a surface plane or planed one side.

C. Q. 36. What position did Mr. John Lewis hold in the Belden Co. at the time he told you to take the foremanship of the shop?

A. I understood that he was the book-keeper of the company, and I afterwards got my orders from him as to the number of refrigerators that I should make of each kind.

C. Q. 37. As general foreman or assistant superintendent what were your duties?

A. My duties were to see to everything all about the shop with the exception of tallying and unloading lumber from the cars after it was shipped in there, and of the shipping of the goods after they left the packing-rooms.

C. Q. 38. State fully how you came to leave the Belding M'f'g Co. in 1886.

A. Mr. F. E. Ranney took in Mr. Hinkle as a stockholder, as he told me himself, to the amount of three hundred dollars, and on account of my trouble in the family he thought it better for me to resign my position. I talked the matter over with him and he told me that I could stay with him at the rate of $2.50 per day, which I told him I would consider and think over, as I had about a month more before my contract was up, and then there were other things came up, and under the circumstances it was partly a quitting on my own account, and partly a discharge. As I understand it; that he wanted to work in some one else as foreman that was nearer related than I was.

446 C. Q. 39. Do you know John C. Martin who worked for the Belding Co. at one time?

A. Yes, sir, I do.

C. Q. 40. Was he at work for this company when you left its employ?

A. No, sir, he was not.

C. Q. 41. When did he leave?

A. I couldn't say as to the exact date when he left, but he was there for awhile after they started up in October, 1885, but how long after that I don't know.

C. Q. 42. How long after you went to work for the Belding M'f'g Co. did Mr. Geo. R. Hotchkiss come to Belding, Mich.?

A. I couldn't say as to that, because I was there to work and putting the machinery in order and getting things ready to run before he came.

C. Q. 43. And you went to work in the latter part of July, did you?

A. No, sir, I did not make that statement.

C. Q. 44. After being hired by Mr. Ranney in July, 1884, how soon did you go to work for the Belding Co.?

A. I went to work for the Belding Co. in August. The exact date I don't remember. I have no way of refreshing my memory or telling what date it was.

C. Q. 45. How soon after this time, August, 1884, did Mr. Lewis put you in charge of the shop?

A. It was some time in the latter part of November or the first of December, 1884.

C. Q. 46. Prior to this latter date were any refrigerators manufactured by the Belding Co., that is between the date when you went to work and the date when you were put in charge of the shop?

A. Yes, sir, there was.

C. Q. 47. What kind were they? Describe them.

A. The same refrigerator they are manufacturing to-day, or at the time I left.

447 C. Q. 48. Can you fix the date of Mr. Hotchkiss' appearance at the shop with reference to the date when you were put in charge of the shop?

A. No, sir, I can't; because Mr. Hotchkiss was there before I took charge of the shop, and a short time after I took charge of it, and what instructions I had were taken from him, with the exception of the cutting bills which were handed to me to work from.

C. Q. 49. About how long after you took charge of the shop did Mr. Hotchkiss remain at the factory?

A. I could not say for certain as to that. He went away and was gone a day or two or three, and then came back again, and was there off and on at various times, and as far as his final leave is concerned I could not say.

C. Q. 50. When did Mr. Fred. Ranney give you your instructions to work under or in accordance with Mr. Hotchkiss' directions?

A. Mr. Fred. Ranney never gave me any instructions positively that I should do so and so, but he says, "Hotchkiss is the man that was sent over here by the company to superintend and see to the starting and making of the refrigerators." He gave it to me as general information that he was the man.

C. Q. 51. Who gave you instructions to make refrigerators just as Mr. Hotchkiss ordered?

A. I took my instructions from what Mr. F. E. Ranney said, Mr. Hotchkiss having been giving instructions to the shops prior to my taking the foremanship, and this conversation informing me that Mr. Hotchkiss was the man that was to see to it was given me by Mr. F. E. Ranney.

C. Q. 52. When?

A. I don't know exactly what the time was Mr. Ranney told me that Mr. Hotchkiss was the man for the first time, but soon after I took the foremanship Mr. Hotchkiss and I had a few words about fitting some doors. He went to Mr. Fred. Ranney and Mr.

448 F. E. Ranney came to me and says, "Mr. Hotchkiss is sent over here to see about these refrigerators, and I suppose you

will have to do about as he says." That is the reply he gave me. I afterwards looked to Mr. Hotchkiss for my instructions as to styles and the way he wanted them done.

C. Q. 53. How many refrigerators were manufactured in 1884 during the time that Mr. Hotchkiss was at the factory?

A. I could not tell you anything about it, for I was only day laborer part of the time and part of the time foreman. What went through before my foremanship I could not tell, nor after I took my foremanship, because I had no way of keeping the record at that time nor access to any of the books in the office.

C. Q. 54. State how you know that the refrigerators made by the Belding M'f'g Co. during the period of your employment by it were not made in accordance with the R. T. Hambrook invention as shown in his patent?

A. Because I have made both of them.

C. Q. 55. The both of what?

A. Both kinds of refrigerators. Had a large experience in one kind, and enough experience in the R. T. Hambrook to know the construction and working of them.

C. Q. 56. Do you know what the Hambrook invention was?

A. I know what they claim it was, or the style of construction.

C. Q. 57. Did you ever use one of the old-style Hambrook refrigerators?

A. No, sir, I never used one personally.

C. Q. 58. How are you then enabled to swear of your own knowledge of the defects of that style of refrigerator?

A. I have heard of their being used and complained of by parties that were acquaintances of mine, and have remodeled them for parties that used them, and they have told me themselves that the water dripped into the provision chamber from the ice-chamber.

449 They have asked me if I knew what caused it. I told them I knew of no reason but the condensation of the warm air coming back into the provision chamber. And furthermore Mr. F. E. Ranney received four or five of the R. T. Hambrook M'f'g Co. back from Detroit while I was an employé of the Belding M'f'g Co. I asked Mr. Ranney what was the matter then. He says, "They are good for nothing." He says, "Have somebody take them and store them back there in the old shed," which was back of the office at that time.

C. Q. 59. Were these refrigerators which came from Detroit old or new refrigerators of the old style; that is, had they been in use or not when received back to the factory?

A. Some of them had been in use. Whether they all had been in use or not I could not say.

C. Q. 60. Were any of them afterwards remodeled?

A. Not that I know of. Not when I was with the company.

C. Q. 61. After the refrigerators were finished, and before they were crated, did you personally examine each and all of them that were manufactured by the Belding Co. during your employment?

A. No, sir, it was not for me to do. I did not examine them all for the reason that when they left the cabinet shop I had to exam-

ine each and every man's work before they went to the filling-room, and after they were filled and sent through the process of being zinc-lined, and being varnished, they were left in the varnish-room for an indefinite number of hours for the varnish to dry. There I took a general look over them to see that the varnish and finish was all right, and then we had foremen that saw to the packing and stencilling, and I very often assisted in doing that myself when they were pushed or when we had to work evenings, overtime, I took hold and helped.

C. Q. 62. How then are you enabled to swear of your own knowledge that none of these refrigerators manufactured prior to October, 1885, contained any patent marks?

450 A. Because their stenciles did not show any patent mark, and it was the only one they had with the exception of the specials that they made for various parties which they had stenciled as they wanted them.

C. Q. 63. How do you fix the date as being October, 1885, when you first noticed the new stencil that contained the words "Patented May 28, 1878"?

A. Because we had no other stencil to use only the old one before that time. We had shut down for repairs, or to put in new engine boilers, and that was about the time for starting up again for general business. Furthermore, being that time of starting up, and the new stencil being brought in, my attention was called to it by the craters or packers.

C. Q. 64. Have you given all the conversation about this new stencil which you had either with the packer or Mr. Ranney?

A. I have given all the conversation I had with the packers, but can't say positively that that is all the conversation I had with Mr. Ranney about the new stencil with the patent on it. I think Mr. Fred. Ranney and I talked about having a new stencil prior to this. Think he told me they would, but didn't say what it was to be.

C. Q. 65. State as accurately as you can how many refrigerators of the old style were ever returned during your employment either by the Hambrook Co. or by the Belding Co.?

A. I could not say, for Mr. Fred. Ranney had changed with some of the inhabitants there in the village, and some had been shipped back, and I could not tell anything about it.

C. Q. 66. Were the ones received from Detroit and the one you altered for Mr. D. E. Wilson the only ones that you saw?

A. No, sir.

C. Q. 67. How many others did you see returned?

A. None others that I know of.

451 C. Q. 68. Give the court your best recollection as to the total number of the old-style refrigerators made during your employment by the Hambrook Co. or its successors?

A. I do not know how many were made for the reason that I did not work for the company during their career of making them, only when they first commenced, and then there was only the sample that was made there in Belding as I understood it, which I helped

make. The balance of them were shipped to Chicago in the knock-down to be put up there.

ARTHUR W. RANNEY.

(Adjourned until Thursday, Dec. 19, 10 a. m.)

(THURSDAY, *Dec.* 19—10 a. m.

SIDNEY M. BROWN, a witness on behalf of the complainant in the cross-bill, and the defendant in the original bill, being first duly sworn to tell the truth, the whole truth, and nothing but the truth in said cause, says in response to interrogatories propounded by Mr. TAGGART, as follows:

Q. 1. State your name, age, residence and occupation.

A. Sidney M. Brown, 30 years, farmer, township of Grattan, Kent Co.

Q. 2. What experience have you had in connection with the manufacture of refrigerators? State fully where you have been employed, and give the time of such employment as nearly as you can.

A. I was employed by the Belding M'f'g Co. in the fall of 1884, on or about the 13th day of Nov., and worked for them until about April 1, 1886, continuously while the factory was running.

Q. 3. At what kinds of work were you engaged while at work for the Belding M'f'g Co.?

A. I worked in the packing-room.

Q. 4. Where was the factory of the Belding Co. located?

452 A. At Belding, Michigan.

Q. 5. What were your duties in the packing-room?

A. I packed and crated the refrigerators ready for shipping.

Q. 6. In what condition were the refrigerators received by you in the packing-room?

A. They were completed ready for packing.

Q. 7. Who put on the stenciling and upon what part of the refrigerator was the stenciling applied?

A. I put on a good deal of it myself, and had to see that it was put on before they were packed. The stenciling was put on the back of the refrigerator.

Q. 8. You will please to give the wording and figuring which constituted the stenciling which was applied to the refrigerators manufactured by the Belding M'f'g Co. while you were in its employ.

A. Until some time in 1885 the stencil read the number first, then "New Perfection, manufactured by the Belding M'f'g Co., Belding, Michigan." After that time they got a new stencil, which read, "New Perfection, manufactured by the Belding M'f'g Co., Belding, Michigan, patented May 28, 1878."

Q. 9. What time in 1885 did the Belding M'f'g Co. begin to use the stencil which contained the words and figures, "Patented May 28, 1878"?

A. Some time, I think, in December.

Q. 10. Prior to the time that the Belding Co. procured the stencil

containing the words referring to a patent, did the refrigerators manufactured by the Belding Co. contain any words or marks of any kind to indicate that the refrigerators were manufactured under a patent?

A. They did not.

Q. 11. You may state whether or not the Belding M'f'g Co. were accustomed to manufacture refrigerators and apply the names of the persons for whom they were manufactured to such refrigerators.

A. They were.

453 Q. 12. Did such refrigerators contain any letters or marks of any kind to indicate that they were patented?

A. They did not.

Cross-examined by Mr. BROWN:

C. Q. 13. How do you fix the date of December, 1885, as the time when the Belding M'f'g Co. first began using the new stencil containing the words and figures, "Patented May 28th, 1878"?

A. Because it was some time after they put in the new engine and boilers.

C. Q. 14. When were the new engines and boilers put in?

A. In the fall or summer of 1885.

C. Q. 15. And how do you know this fact?

A. Because I was working for the company after they started up at that time.

C. Q. 16. Is that the only means you have of fixing the date?

A. The date of what?

C. Q. 17. The date of the first use of the new stencil containing the patent marks.

A. I know there was no other stencil there but the old one until about that time, that I knew of.

C. Q. 18. Then, as I understand you, the only means you have of knowing that this new stencil was first used in December, 1885, is from the fact that you remember it was after the new boilers were put in, in the summer or fall of that year. Am I right?

A. You are.

C. Q. 19. Am I also right in understanding that the only means you have of knowing that the new boilers were put in the summer or fall of 1885 is from the fact that you worked for the company there at that time?

A. I have no means of knowing but just through memory. I know the boilers were put in at that time.

C. Q. 20. Did you examine all of the refrigerators that were shipped from the factory before each was sent out?

454 A. They all went through my hands in the packing-room.

C. Q. 21. Did you examine each refrigerator that left the packing-room before it was placed in the warehouse?

A. No, sir.

C. Q. 22. Did you examine each refrigerator that was shipped from the warehouse?

A. No, sir, I did not.

C. Q. 23. How do you know then that all of the refrigerators manufactured at Belding by the Belding Co, prior to Dec., 1885, were not stenciled or marked with the words "Patented May 28, 1878," if you did not examine all of said refrigerators before they wers shipped from the factory?

A. Because we always marked them before they went to the warehouse.

C. Q. 24. Will you swear that after crating or packing the refrigerators you did not prior to Dec., 1885, send to the warehouse refrigerators having no stenciling on at all?

A. There were none sent, to my knowledge, without the marking on.

C. Q. 25. Will you swear that the stenciling on the refrigerators was not altered or changed in any way in the warehouse, or that no new stenciling was put on the refrigerators in the warehouse?

A. Not to my knowledge, there was not.

C. Q. 26. Give the names of the other workmen in the packing-room.

A. The first season there was a man named Brunson, helped me. After he went away there was a man by the name of John Arwine, He and I were supposed to do the work in the packing-room. Of course, we had to have some help once in awhile.

C. Q. 27. Whose duty was it to place the stenciling on the refrigerators in the packing-room?

A. It was the packers' duty.

455 C. Q. 28. Do you recollect ever being sent to the warehouse to alter or restencil or stencil anew any refrigerators there?

A. I do. There was some stenciling to do there, but I do not know what it was for. It was a special stencil for some firm, or their own stencil, I don't remember which.

C. Q. 29. Do you remember whether any of the other packers were sent to the warehouse on similar duties?

A. No, I do not.

C. Q. 30. You have stated that you were employed by the Belding M'f'g Co. about Nov. 13, 1884, and worked until about April 1, 1886. How do you fix these two dates?

A. Nothing only through memory. I know I quit work there the day before town election I think. I was going to Dakota that spring.

C. Q. 31. Did you leave voluntarily, or were you discharged for any reason?

A. I left voluntarily.

C. Q. 32. What instructions did you have, if any, regarding the stenciling and placing a patent mark on the refrigerators?

A. I do not understand what the question refers to.

C. Q. 33. I want to find out whether or not any foreman, superintendent or officer of the Belding Co. gave you any instructions about placing the patent mark on the refrigerators, and if so, what those instructions were.

A. The new stencil had the patent mark on it and we were in-

structed to put the stencil on the refrigerators. That is all the instructions I know of or remember.

C. Q. 34. Who gave you those instructions.

A. They were given by some of the officials there, I don't remember which.

SIDNEY M. BROWN.

456 ADDO J. GARDNER, a witness on behalf of the defendant to the original bill and the complainant to the cross-bill, being first duly sworn to tell the truth, the whole truth, and nothing but the truth in said cause, says in response to interrogatories propounded by Mr. TAGGART as follows:

Q. 1. State your name, age, residence and occupation.

A. Addo J. Gardner; live in Belding, Ionia county, Mich.; am thirty-five; no occupation just at present.

Q. 2. You may state what has been your occupation during the principal part of two years past.

A. I have been in the ice business.

Q. 3. At what place?

A. Belding, Mich.

Q. 4. Are you acquainted with the refrigerators manufactured by the Belding M'f'g Co. at Belding, Mich.?

A. A good many of them.

Q. 5. What opportunities have you had for examining such refrigerators in said village?

A. I have filled a goodly number of them in the village from two to four times a week during the hot weather the past two years.

Q. 6. How many refrigerators all together have you filled in the village of Belding, and what proportion of them were not Belding refrigerators?

Objected to by counsel for complainant as immaterial and incompetent.

A. As near as I can remember, about seventy. Four or five of these were not Belding refrigerators.

Q. 7. If you have any memorandum which will enable you to give the exact number of refrigerators filled by you in Belding, you may refer to the same and give the exact number.

Last objection repeated.

A. Seventy-one.

457 Q. 8. You may state whether or not you have examined the Belding refrigerators which you have been accustomed to fill with ice from two to four times a week in the village of Belding for the purpose of ascertaining whether or not such refrigerators contained any marks or letters indicating that the same were patented.

A. I have a few of them.

Q. 9. You may state how many of them, if any, you have found that contained no mark of any kind indicating that the same were

patented, and you may give the names of the persons in whose possession you found such refrigerators.

A. I found I think thirty-four or five. I cannot tell the names without referring to memorandum.

Q. 10. If you have any memorandum which will enable you to give the names called for in the last question, you will please refer to such memorandum and give the names to the notary.

A. I have such a memorandum. The names and numbers of refrigerators are: Wilson Orser, No. 10½; Mrs. Smith, No. 9; Mrs. Hogle, No. 3; John McCue, No. 9; John Barker, No. 9; Washburn, No. 10; Geo. Griffin, No. 9; Mr. Hinkle, No. 9; Val. Savage, No. 9; Milton Earle, No. 9; Wm. Unger, No. 9; Edwin Spencer, No. 1; Mr. Walker, No. 10½; Frank Guiles, No. 9; E. Kimberlee, No. 9; Mr. Osborne, No. 10; McElroy, No. 9; Mrs. Thomas, No. 6; Joe Cobb, No. 9; Levi Tuttle, No. 4, in the town of Grattan; Kinion, No. 10½; Holmes & Connell, No. 17; Blystone, No. 1; Barker, No. 10; Charles Crawley, No. 1; Henry Leonard, No. 10; Goodwin, No. 9; Spannagel, No. 9; Asa Fuller, No. 1; Joseph Angel, No. 9.

Q. 11. You may state whether or not these refrigerators which you have referred to as not containing any patent mark, contained any stenciling or lettering to show that they were manufactured by the Belding M'f'g Co.

A. They do. There is a plate in front which reads, "New Perfection, manufactured by the Belding M'f'g Co., Belding
458 Mich." They are stenciled on the back. That is, the number first, then it reads, "New Perfection, manufactured by the Belding M'f'g Co., Belding, Mich."

Cross-examination by Mr. BROWN:

C. Q. 12. How do you know that all but about five of the seventy-one refrigerators referred to were manufactured by the Belding M'f'g Co.?

A. They are all marked with a plate in front in plain sight. On the front is a little plate four or five inches long. I am not positive about the length; it might be a little longer or it might be less.

C. Q. 13. How many of the seventy-one refrigerators did you examine to ascertain if they contained any patent marks?

A. I could not tell the exact number.

C. Q. 14. How did you make the examination?

A. They are universally sitting against the wall, and in order to see the back they have to be moved out. I turned them around from the wall so I could see the marks.

C. Q. 15. When did you make this examination?

A. I think it was the 20th of November.

C. Q. 16. What is the memorandum book to which you referred in your direct examination?

A. It is just a little advertising book that I took these names and numbers down in.

C. Q. 17. You had another memorandum book besides this to which you first referred?

A. I did.

C. Q. 18. Were the memoranda in those books made by yourself?

A. Yes, sir.

C. Q. 19. Will you produce these two books and offer them in evidence?

A. There are some private matters in them. You can take out those leaves.

C. Q. 20. You may remove, then, from one of the books all the leaves or pages containing any memoranda relating to the matters of which you have testified and submit said pages and the other book to the notary.

459 A. I have and here produce them.

Counsel for complainant offers in evidence the book referred to by the witness and identifies the same with this record as "Complainant's Exhibit Gardner Memorandum Book."

Counsel for complainant also offers in evidence the three pages from another memorandum book handed in by the witness, and the same are identified with this record as "Complainant's Exhibit Gardner's Memorandum, pages 1, 2 and 3."

C. Q. 21. What mark or marks are there in the book "Exhibit Gardner's Memorandum Book" by which you are enabled to say that you examined seventy-one refrigerators, all but five of which were manufactured by the Beld- Co.?

A. I did not know that I had said I had examined seventy-one.

C. Q. 22. Your answer to question 6 was that you filled about seventy, and "four or five of these were not Belding refrigerators." I now again ask you cross-question 21.

A. There is no mark in that book that would tell what kind of refrigerators I have filled.

C. Q. 23. Are the refrigerators mentioned in the list in answer to question 10 the only refrigerators of the seventy-one which you say you know were made by the Belding Co.?

A. That is all that I know of.

C. Q. 24. And you are positive, are you, that the refrigerators mentioned in your answer to question 10 were made by the Belding M'f'g Co.?

A. Yes, sir; that is, I am positive that their plate is on the refrigerator.

C. Q. 25. And the only means you have of knowing that those refrigerators were made by the Belding Co. is from the fact that the plate referred to is upon the refrigerators?

A. The plate and the stenciling on the back.

460 C. Q. 26. Did you examine the inside of the refrigerators mentioned in the list you have given?

A. I opened the doors in front and the lid in the top to see if there was any patent marks inside them.

C. Q. 27. On what part of the refrigerators mentioned in the list you have given was the number placed?

A. The stencil number is on the back. There is a number stamped sometimes on the jamb of the lid.

Redirect examination:

Q. 28. State whether or not you were the only person in the ice business at Belding during the summer of 1889.

A. The only one that I know of.

ADDO J. GARDNER.

STATE OF MICHIGAN, } ss:
County of Kent, }

I, Hugh E. Wilson, a notary public in and for said county and State, duly authorized to administer oaths, do hereby certify that on the 17th day of December, 1889, commencing at ten o'clock in the forenoon of that day, the depositions of George R. Hotchkiss, John C. Martin, Arthur W. Ranney, Sidney M. Brown and Addo J. Gardner, witnesses on the part of the defendant in the original bill and the complainant in the cross-bill, entitled in the caption hereto, were taken before me at my office, No. 83 Lyon street, in the city of Grand Rapids, Michigan, pursuant to adjournment.

That each of said witnesses was by me first duly sworn to testify the truth, the whole truth and nothing but the truth in said cause, and was examined by Edward Taggart, Esq., counsel for defendant in original bill and complainant in cross-bill, and was cross-examined by Taylor E. Brown, Esq., counsel for complainant in original bill and defendant in cross-bill, and the testimony of each of said witnesses was reduced to writing in the presence of said witnesses and counsel therein noted as present, and
461 each of said witnesses then and there subscribed the same as and for his deposition in said cause.

And I further certify that the exhibits offered in evidence by counsel for defendant are returned herewith duly marked. And I further certify that I have no interest whatever in the result of this suit.

In witness whereof I have hereunto set my hand and seal this 20th day of December, 1889.

HUGH E. WILSON,
[NOTARIAL SEAL.] *Notary Public, Kent Co., Michigan.*

UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Western District of Michigan, Southern Division. In Equity.

BELDING MANUFACTURING COMPANY, Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY, Defendant. } Original Bill.

CHALLENGE CORN PLANTER COMPANY, Complainant,
vs.
BELDING MANUFACTURING COMPANY, Defendant. } Cross-bill.

Depositions on behalf of the defendant to the original bill and the complainant in the cross-bill entitled above, taken before Hugh E. Wilson, a notary public in and for the county of Kent, State of Michigan, at his office, No. 83 Lyon street, in the city of Grand Rapids, in said county, commencing at ten o'clock in the forenoon of the 7th day of January, 1890, pursuant to stipulation.

Present: Edward Taggart, Esq., counsel for the defendant to the original bill and complainant in the cross-bill, and Taylor E. Brown, Esq., counsel for complainant in the original bill and defendant to cross-bill.

462 JAMES W. SEE, a witness on behalf of the defendant to the original bill and complainant in cross-bill, being first duly sworn to tell the truth, the whole truth and nothing but the truth in said cause, says in answer to interrogatories propounded by Mr. TAGGART as follows:

Q. 1. State your name, age, residence and occupation.

A. James W. See, thirty-nine, Hamilton, Ohio, consulting engineer.

Q. 2. What experience have you had, if any, in the investigation and application of the mechanical arts? What experience, if any, in the examination and comparison of mechanical devices to determine their similarity or difference, and what experience in comparing mechanical devices with descriptions of mechanical devices, such as letters patent, for instance, and actual construction?

A. I have served in a number of capacities in various manufacturing establishments, from apprentice, journeyman mechanic, foreman, to designer. In later years my work has been that of a consulting engineer to a large number of manufacturing concerns, it being my duty to pass on new machines, or articles of manufacture, or on proposed designs for them, with a view to determine their fitness for the end in view, and their adaptability to economical manufacture. This latter part of my work has brought me largely into connection with patents, the vital question often being, will the proposed construction come into conflict with any existing patents? To fit myself for this part of the work I have made a regular study of the patent law, and have had extended dealings with the Patent Office as solicitor for patents upon features of novelty. I have thus acted in some hundreds of cases. I have contributed largely to the

technical press of the country, and much of this matter has been reprinted in book form and used as text books in technical institutions of learning. I am now engaged as consulting engineer to a large number of factories in this country and some in Europe. I am frequently called upon to testify in litigation involving technical matters and patents.

463 Q. 3. Have you examined letters patent of the United States No. 204,216, issued to Richard T. Hambrook May 28, 1878, and do you understand the structure therein described, and have you examined a refrigerator purporting to have been constructed in accordance with said patent, offered in evidence by the defendants as "Defendant's Exhibit the Hambrook Refrigerator," such refrigerator being now situated in the United States Government building in this city?

A. Yes, sir; I have examined that patent and believe that I fully understand it. I have examined a refrigerator in the Government building and marked in this cause as you have indicated. That refrigerator responds to the Hambrook patent.

Q. 4. Have you examined the defendant's refrigerators, referred to in the complainant's testimony as "Complainant's Exhibit, Defendant's Refrigerator No. 1," and "Complainant's Exhibit, Defendant's Refrigerator No. 2"?

A. I am familiar with the refrigerators manufactured by the defendants, and have examined and fully understand the various styles of refrigerators which they make, among others refrigerators said to be exact duplicates of the exhibits which you refer to, those exhibits not being in Grand Rapids, the understanding being that my testimony based on the duplicates should have the same force as though based on the original exhibits now in the possession of the complainants, having been so retained by understanding to avoid the expense of frequent shipping.

Q. 5. Referring now to the specifications and drawings of the Hambrook patent No. 204,216, please state what you understand to be the invention therein described and referred to in the claims, what novelty, if any, you find in such combination, in view of the prior state of the art illustrated by any matters within your knowledge or command, giving your reasons for any opinion or opinions you may express.

464 A. This patent relates to refrigerators, and the patent exemplifies the affair by a domestic ice-box structure. It is to be understood, of course, that the exterior form or decoration of the box has nothing to do with the matter of the patent. The manufacturer of refrigerators gives to the exterior such form and adornment as seems best suited to the market, being controlled by precisely the same rules that hold good in designing the exterior of a trunk, or a bedstead, or a wardrobe. In the architectural features of designs, and in the elaboration of ornament, and in the wood selected for the casing, and in the painting or varnishing of it, and in the trimming of it with hardware and the like, he seeks to follow the shifting sense of popular taste. The present patent is concerned with the interior of the box only. Before going into the

merits of this particular patent, it may be well for me to indicate in a general way the main points controlling the construction of refrigerators, and to point out also the general state of the art prior to the Hambrook patent.

The problem or motives in all refrigerators is to transfer the heat out of a warm article. Heat will readily move from a warm article to anything colder, the tendency being toward uniformity in all neighboring things. If a cold kitten lies by a hot brick, the brick gets colder and the cat gets warmer. If a hot potato lies in a box with a lump of ice, heat will leave the potato and go to the ice, the ice will melt, and the heat will be in the water produced, and if we take this water out of the box we have really carried away the heat that came from the potato. The modern refrigerator is a device for getting the heat of articles to transfer itself to water which may be taken away from their neighborhood.

A simple box of ice with a drain-hole, and with the articles to be cooled set directly in the ice, is an inconvenient and damp affair. What is wanted is a compartment for the ice, and a separate compartment for the food. Furthermore the box should have its walls so constructed that heat from exterior objects will not pass inward to the box and waste the ice. Refrigerators have for many
465 years been constructed with the provision chamber separate from the ice-chamber, and with the box walls of jacket construction filled with non-conducting material, or having air spaces so as to insulate as far as possible the interior of the box from the exterior atmosphere.

Assume that the ice-chamber be located underneath the provision chamber. This is very handy, but it is scientifically wrong, for it has been long recognized that warmer air has greater buoyancy, and consequently the proposed arrangement, though quite handy, would give us the warmer air in the provision chamber. In recognition of this fact, refrigerators have for years been made with the provision chamber disposed below the ice-chamber, a horizontal partition separating the two.

But to get the best effects in the provision chamber it is necessary that the air therein be air which has previously been subjected to the action of the ice in the ice-chamber. Refrigerators have therefore been long constructed to allow a circulation of the air between the ice-chamber and the provision chamber.

A positive circulation of air is wanted in a continual round. The air must go to the ice and get cold, then go to the provisions and abstract heat from them, then go to the ice again and surrender that heat to the ice, and then go cold again to the provisions. The heat thus given to the ice melts it, and the water drains off, carrying the heat with it. Refrigerators for years have been thus constructed.

But how can this circulation of the air in a continual round be secured? It was long since recognized that different portions of cold chambers had different temperatures, that portion nearest the walls of the chamber being the warmest. In recognition of this fact it has long been customary to arrange uptake flues near the walls of the chambers, the comparatively warm air rising through

these flues from the provision chamber to the ice-chamber.
466 The air, becoming cooled in the ice-chamber, descended through more central flues or openings to the provision chamber below, and, upon becoming again warmed, rising again through the uptake flues, and so on in a continual round.

(Adjourned until 1.30.)
(1.30 p. m., witness continued.)

I have spoken of the ice-chamber as being commonly separate from the provision chamber. This description is hardly correct. Imagine a single chamber greatest in its vertical dimensions. Put the ice in the upper part of this chamber, and reserve that upper part exclusively for the ice. Thus used there would be but one chamber. But there must be something in the way of a floor to support this ice in its position, and it is this ice-rest which is generally looked upon and which I have assumed as a partition, serving to apportion the chamber into two chambers. Such horizontal partition or ice-rest has long been used for such purpose in refrigerators.

It is well at this point to consider the character of this ice-rest. If the rest or floor is absolutely continuous, forming a tight partition, then it is obvious that the system of air circulation I have described could not be realized, because the hot air could not get up to the ice, and the cold air could not get down from the ice to the provision chamber. The requirements have long been recognized, and the uptake flues have accordingly been made to place the two chambers in communication, regardless of the partition or ice-rest, and the ice-rest has been provided with openings which would permit the downward passage of the air when cooled. The ice-rest has therefore long taken on the form of a rack or perforated septum, which would support the ice properly, and still permit the downward passage of the air to the chamber below.

But the ice is constantly melting, and if the perforated ice-rest would permit the downward passage of air to the provision chamber, it would also permit the downward passage of this water to
467 the provision chamber. Now it is highly desirable, and has always been so recognized, that water and all moisture as far as possible shall be kept out of the provision chamber. Even the circulating air should come to the provision chamber as dry as possible. For this reason it has long been usual to dispose below the open-work ice-rack some sort of horizontal pan to catch all the drippings from the ice and drain them to a waste pipe leading outside of the apparatus, the outer end of the waste pipe being usually provided with a water seal to prevent the inflow of air from the outside or the outflow of air from the inside. This pan therefore served two purposes: first, it served as a roof to the provision chamber to prevent the dropping of water thereinto from the ice; and second, it served as a drainer for that water.

It will thus be seen that we have really found two horizontal partitions separating the provision chamber from the ice-chamber, one an essentially leaky ice-rest, and the other an essentially tight

water pan. Either or both together may be looked upon as the real partition. But this water pan, while it must be tight to prevent the descent of the water to the provision chamber, must not constitute a partition to prevent the down movement of the air. This has long been recognized and provision made for it by placing an opening in the pan at that point where the descending column of air is to pass to the provision chamber. It would now look as though we had put a tight pan under the leaky ice-rest to prevent the descent of the water, and had then deliberately put a hole in the pan to permit the descent of the air, thus apparently emasculating the pan for its intended office. But it has long been customary to so flange or guard the margins of the air passage in the pan that, while the air could move down through it, the water would not pass down through the opening, but would drain over the surface of the pan.

But if we have a leaky ice-rest, and if we introduce a pan to catch the drip from that ice-rest to prevent its passage into
468 the provision chamber, and if we then put a hole in the ice-pan to permit the passage down into the provision chamber, what is to prevent the dripping, from immediately over this air-hole, from going right down into the provision chamber, no matter how carefully we may guard against the flow from the pan surface directly through the opening? This has long been guarded against by the simple expedient of putting an imperforate roof under the ice directly over the air opening in the pan. The pan has always been sloped so as to properly drain to the discharge pipe. Sometimes there was a single air opening down through the pan, requiring but a single roof to protect it from such drip as might take place immediately above it. Sometimes there were numerous air openings in the pan, each provided with an imperforate roof. Sometimes the ice rest or rack was employed, and sometimes these protecting roofs were employed as the ice-rests.

Sometimes the provision chamber was shingled, and in other cases it was provided with partitions, either vertical or horizontal, or both, to divide it into compartments for the more ready storage of the provision, the multiple provision chamber, however, being generally unified by some intended or incidental communicating air passage between them. Doors and shelves and such like accessories have long been provided to best fit the apparatus for its intended use. In some cases, the internal parts have been made of wood, in other cases of metal, and in other cases of wood faced or lined with sheet metal, zinc being generally employed for the purpose.

I have thus outlined, without reference to exhibits, the general features long recognized in connection with the art. The features which I have mentioned include about all that will be of interest in the present case. I will now make specific reference to illustrations of these features in the prior arts.

Patent 60665, of 1867, to Banta, will be first considered, in
469 connection with its drawing. The box has non-conducting walls. The upper portion of the box is apportioned to ice, and the lower portion to provision chambers.

The floor of the ice compartment is a slatted grate, *h*. Underneath this grate are sloping partitions, *i*, to prevent the drip from falling to the provision chamber. They discharge the drip to the catch-gutter, *k*, from whence it flows down through tube *l*. The drip eventually flows out through a hole in the bottom of the box to a waste pan, but in its passage, before leaving the box, it is caused to flow over a barrel of liquor in the base of the box to serve in cooling the contents of the barrel. Just underneath the ice-grate, a water coil is introduced to furnish ice-water for drinking. These drinking-water attachments are quite common in modern refrigerators.

Flues 10 pass up alongside the ice compartment, and lead the air from the provision chamber upward, as indicated by the arrows in the drawing. Instead of a water pan under the ice-grate, with a hole in it to permit the downflow of air, two sloping shelves, *i*, are arranged to lap by each other, as shown in Fig. 1. This intercepts the water and conveys it to the gutter, and still permits the downflow of the air. Assume that the left-hand one of the sloping shelves, *i*, in Fig. 1 were omitted. The right-hand shelf would then present the aspect of having an air opening at its extreme left, and drip from the ice directly over this opening might fall directly downward. But the introduction of the short left-hand sloping shelf forms a roof over this opening and causes the drip-water falling on it to be delivered further up the body of the main shelf, whence it drains to the gutter. This inventor, while providing for the general system of circulation I have heretofore referred to, provides also for certain dealings with fresh air, with which we are not concerned, and he also arranges much of his interior construction of slate, with which we are not concerned. The patent serves to illustrate a general construction and also such details as—

470 Ice-chamber at top.
Provision chamber below.
Uptake flues from provision chamber to lead the air to the ice.
Open-work ice-rest.
Sloping drain-floor thereunder.
Passage therein for downflow of air.
Catch-gutter.
Drain-pipe therefrom.

The circulation of air is the roundabout system before referred to, the front wall of the refrigerator being considered as the warm one to produce the upward motion, the patent stating, "The warmer air in the front part of the refrigerator ascends through the space 7, and then passes down in the space 8 * * * into the ice-chamber across below the ice where any vapors held in suspension are condensed and pass away with the water. Thence the air descends being cooled, in contact with the slate bottom and back again into the refrigerator, thus rotating and cooling the refrigerator." As an alternative plan, valves are provided if a ventilating system is wanted.

Patent 77624, of 1868, to Koch. The box is circular with nonconducting walls, and without doors, the top or cover being remova-

ble. The patent illustrates a very small portable style of refrigerators. The ice is in the upper part, supported on a perforated ice-rest. The provision chamber is a vessel, E, set in the lower part of the box. It is intended that this small affair may be lifted out, if desired. The roof of the provision chamber sheds the water which drips from the ice and prevents that water from entering the chamber. The water is retained around the vessel for a time, instead of escaping freely.

The roof of the provision chamber has an opening, *i*, to permit the passage of air to and from the provision chamber. Drip-water would flow from the perforated ice-rack directly down into the provision chamber through this circulating hole. But, to pre-
471 vent this, a roof cap, *k*, is placed above this circulating hole, so that the drip directly over the hole will be deflected onto the main roof of the provision chamber.

This patent provides also for a ventilating system, and it does not provide separate openings for the inflow and outflow of air in connection with the provision chamber. The patent is of interest in illustrating a common expedient to permit an air passage to be located directly below leak-holes in the ice-rest, such expedient consisting of a deflecting plate over the hole.

Patent 95428, of 1869, to Chase. In this patent we have a provision chamber *g*, below; an ice-chamber *f*, above it; a perforated ice-rest, *c*; an uptake flue, *e*, leading from the provision chamber to the ice-chamber; a catch-pan underneath the ice-rest; a gutter and discharge pipe thereto; an air opening, *h*, at one edge of the ice-pan for the descent of air; non-conducting walls; and the round-about circulating system I have before referred to. The patent says: "The weight, as well as the tendency to a vacuum, drives the air from the remotest upper part of the chamber *g*, where it naturally collects, through the conduits *e e*, and into the upper part of the ice-chamber, and is precipitated upon the ice therein, this passage or flowage of air through the apparatus becoming afterwards self-contained and regular." The system employed is essentially the circulating system, no external air being dealt with, except that incident to opening the doors for access.

Patent 129,671, of 1872, to Little. This patent is of interest only in showing the perforated ice-rack *y'*, in connection with a trough, C, directly below it, to prevent drip from falling directly into the provision chamber, the trough having a waste pipe. The main floor of the ice-chamber consists of a double-inclined bottom *v*, having a central opening guarded in the manner mentioned.

Patent 61734, of 1867, to Harris, shows the upper ice-chamber; grated ice-rest, *h*; vertical partition *k*, in the provision chamber; flues in the walls for the passage of air; a pan underneath, *i*,
472 the ice-rack; an opening *n*, to permit the air to pass from the ice-chamber down to the provision chamber; a gutter and waste pipe and trap seal for the disposition of drip-water caught by the pan; and non-conducting walls. Especial attention is called to the narrow opening *n*, which permits the air to flow through the pan. The edge of the pan projects inwardly over this opening, par-

tially over the trough, so the drip-water cannot drip through the opening.

Patent 62643, of 1867, to Law, shows the ice-rest as formed of corrugated sheet metal disposed upon the upper surface of the drip-pan. The drip-pan has a double incline to its central opening E, the drip-water going to a catch-trough, and thence out by pipe. There are side flues D, to pass the air from the provision chamber to the ice-chamber; the circulation is the continuous one I have before referred to. "The air, cooled by contact with the ice in the ice-chamber B, passes down through the space E, and into the provision chamber I, * * * abstracting the warmth therefrom. It then rises through the spaces D, into the ice-chamber B, to become again cooled, thus keeping up a constant circulation through the interior of the refrigerator."

Attention is now called to a special feature of this device. The inventor has his double-inclined drip-pans, and on those pans he lays the corrugated ice-rests C. Why does he not put the ice directly in the pans and dispense with the corrugated rests? The reason is this: If the ice laid directly on the pans, if the pans were of metal, they would get very cold. Arising warm air, which had gathered moisture from the provisions, would strike the under surface of these pans, and the moisture would condense thereon in the form of heavy sweat, and this moisture might fall into or dampen the provision chamber. The inventor therefore employs the corrugated metal, which keeps the ice away from the metallic pans, the intervening strata of air tending to a certain degree to insulate the pans and prevent this sweating. "This second bottom may be
473 made of zinc, or any other suitable material, and it is designed to prevent the air that arises from the provision chamber, I, from having its moisture condensed by coming in contact with the cold under sides of the plates that support the ice, and thus dropping back into the said provision chamber and injuring its contents." Here we have a new condition provided for. Condensation is guarded against, and the means consists in a corrugated ice-rest and a plate thereunder, an insulating strata of air being confined between them.

Patent 175,143, of 1876, to Page, shows the upper ice-chamber, the lower provision chamber, uptake flues from one to the other, a drip-pan under the ice-chamber, a central opening therein for the downflow of air, and a roof over this opening to prevent the descent of drippings through the opening into the provision chamber. This inventor, instead of putting the air into direct contact with the ice, prefers to enclose the ice and thus produce a cold body with which the air is to come into contact. The pan under the ice may be considered as the horizontal partition of the system, and the inventor so refers to it. This patent is of special interest in showing how the drip-pan may have an opening for the downward passage of air, and how a deflecting roof over that opening may prevent the downward passage of water directly through the opening. Water in the pan is prevented from flowing through the opening by the simple expedient of upturning the margins of the opening.

I here present a certified copy of that part of the Patent Office model of this Page patent which refers to the pan, or horizontal partition, as the inventor calls it. The round holes in the bottom of the pan model is for connection to the waste pipe. The large rectangular hole is for the downflow of air; the upturned shores of this opening are to confine the water to the pan; and the roof over the opening is to prevent the drip from above from passing down through the opening to the provision chamber. I will designate this model as "Defendant's Exhibit Page Model."

474 Patent 121,899, of 1871, to Rohrer, shows the ice-chamber in the top, the provision chamber below; a grated ice-rest H, double-inclined pans, P, below the ice-rest, quite a number of large air passages through these pans, a gutter and drip pipe from the pans, and a deflector or roof over each of the openings in the pan. There are so many openings in the pans that the pans present the aspect of a grated construction. The air movement is the circulating one I have before referred to. There are uptake flues for the air; the pans have double inclines, the pans have openings for the passage of air; these openings have deflectors to prevent drip therethrough; and there is a perforated ice-rack.

I here present a model, duly certified, in duplicate of that portion of the Patent Office model which relates to the ice-box of Rohrer's patent. The round hole in the gutter is the discharge hole for the drip-water. Notice that the pan catches the drip. Look underneath and notice that the pan has numerous large openings for the passage of air. Notice that the drip would naturally fall down from the ice through these openings and into the provision chamber. Notice that a deflector over each opening prevents this. I designate this model as "Defendant's Exhibit Rohrer Model."

Patent 23803, of 1859, to Yost, is of interest in showing a drip-pan underneath the ice, openings therethrough for the passage of air, and through which the drip might fall to the provision chamber, and curved deflecting plates roofing these openings and serving to prevent such passage of the drip. This patent shows a vertical partition dividing the provision chamber.

Reissue patent 4789, of 1872, (original 103,386, of 1870), to Hunt, shows the box in circular form, but otherwise not differing in principle from the general system of refrigerators which I first mentioned. The ice-chamber, J, is above; the provision chamber has shelves, D, which can be screwed up or down; the walls of
475 the ice-chamber set further inward than the main walls, thus forming uptake flues up alongside the ice-chamber; holes, *i*, let this flue air reach the ice; there is a perforated ice-rest, T; there is a pan under the ice-rest; this pan drains to the center; a waste pipe leads therefrom; there are numerous openings through the pan to permit the passage of air; water would drip from the ice down through these holes to the provision chamber; there is a deflector roofing each of these openings and preventing such passage; there is the circulation which I have before referred to.

I here present a certified Patent Office duplicate of the model of this patent. The ice-chamber can be lifted out of the top. Exam-

ine its bottom. Notice the holes through which water from the ice could flow to the provision chamber. Notice the deflectors roofing each of these openings. I designate this model as "Defendant's Exhibit Hunt Model."

Patent 161,928, of 1875, to Butler, shows the upper ice compartment; the perforated ice-rest which would drip down into the provision chamber; a pan disposed thereunder with double inclines; there is a central opening from the pan; a trough and waste pipe to the pan; and a deflector arranged in the pan over the central opening. This deflector takes the form of a shallow, hollow vessel, employed as a cooler for drinking water.

Patent 14510, of 1856, to Lyman, shows the general arrangement of circulation and details which I first referred to in illustrating the state of the art, this being one of the earliest patents relating to the system. Here we have the ice-chamber above; a perforated support for the ice; a passage leading upward from the provision chamber to the ice; and a passage leading downward from the ice-chamber to the provision chamber. Notice that the perforated ice-rack would drip into the provision chamber; that there is a sloping pan placed thereunder; that there is a drain-pipe from the pan;
that if the pan went clear to the right-hand wall of the re-
476 frigerator the air could not pass down; that there is an opening there provided for such passage of the air; that this opening communicates with a down flue; that the edge of the opening is turned up to prevent pan water from flowing into the opening. But what is to prevent the perforated ice-rack directly over the opening from dropping its water directly into the opening? Answer, the simple expedient of a non-perforated roof over that opening, forming that part of the ice-rack as an imperforate part.

This Lyman patent is, as I have before stated, one of the earliest in its art, and it illustrates the refrigerator formed with a single provision chamber and a single ice-chamber. Take another refrigerator exactly like it, but made left-handed, and stand it against the one shown in the drawings, and nail them together if you will. You will then have a double refrigerator, and you may use either side at will. You may have a hot side and a cold side if you please. This double refrigerator will then have the following features:

Two provision chambers.
Ice-chambers at the top thereof.
Passages from the provision chambers up to the ice-chambers.
Perforated ice-racks, which would drip into the provision chamber.
Drip-pans with double inclines toward the center.
Central openings therein for the down passage of air.
Upturned margins thereto to restrain the water.
Drain-pipes.
The circulation of all modern refrigerators.
An imperforate roof over the central opening in the drip-pan.

Patent 193,563, of 1877, to Smith, shows substantially the arrangement I have just indicated. Here we have the ice-chamber above; two provision chambers below; a perforated ice-rest; up flues from

provision chambers to ice-chamber; an ice-pan under the ice-
477 rack; a central opening therein, serving for the downflow of air in common to both provision chambers; upturned margins at this opening to restrain the water; a drain-pipe from the pan, and an imperforate part of the perforated ice-rest roofing this opening in the pan.

Patent 13802, of 1855, to Sanford, shows the system of circulation into which we have inquired. The open ice support; a drain-pan under the same; a waste pipe; and numerous openings through the pan for the down passage of air to the provision chamber. If these openings were unguarded, then the drip-water would fall through them to the provision chamber. But each opening has a deflector over it. These deflectors are formed by lips of metal projecting from the surface of the pan directly over the openings.

Referring now to the Hambrook patent, about which you inquired:

It shows two provision chambers; an ice-chamber above; flues, *c*, leading up from provision chamber to ice-chamber; a perforated ice-rack, c^1; a pan under the ice-rack provided with two inclines *x*, *y*; a central opening therethrough for the down passage of air; gutters at the edge or margin of this opening to restrain the water; a drain-pipe connected with the gutters; and a deflector over the opening to prevent the water from dripping from the ice down into the provision chamber.

The inventor states that the partition, B, may run clear up to the top of the refrigerator, thus cutting it entirely in two, and making precisely such a double machine as I have indicated in connection with the Lyman patent. The specification is quite lengthy, but it describes nothing of interest further than I have indicated. The specification would lead me to believe that it was written in ignorance of the state of the art, the intention being to found thereon claims for something more than mere construction of the re-
478 frigerator. Probably the inventor deemed himself at that time a pioneer in the matter. In his second paragraph he says: "The nature of my invention consists in the construction of a refrigerator," etc., etc. By referring to the file-wrapper of the application, I find that the language originally was: "The nature of my invention consists in the construction and arrangement of a refrigerator," etc., etc. The language "and arrangement" was stricken out after the state of the art was partially disclosed and the claims rejected.

The first claim originally filed was:

"1. The combination of the open-work platform C^1, with the ice-chamber, C, for the purpose of holding the ice so that the air may circulate about it, substantially as described."

This claim was, of course, untenable in view of the state of the art I have indicated, and was promptly withdrawn on rejection.

The second claim originally filed was:

"2. So combining the ice-chamber, C, with the rack, c^1, for holding the ice, with the provision chamber, as that a continuous and unimpeded circulation of air may be maintained about all sides of

the ice in the ice-chamber, and also through the provision chamber, so that the dampness of the circulating air may be absorbed by the ice each time it impinges on it, and be dried and refrigerated and permitted to fall by gravitation, substantially as described."

There was nothing new in that claim, as it was just what Lyman had invented many, many years ago. The claim was promptly cancelled on rejection.

The third claim as originally filed was:

"3. The mode described of ventilating the provision chambers D, D, in combination with the rack c^1, and the inclined bottom pieces x and y, and the gutters, Z, Z, and the narrow spaces c, c, for the less frigid air to rise through without meeting and without its moisture being condensed by the descending column of cold air, substantially as described."

This claim also was nothing but Lyman's invention, and
479 was, of course, not allowable. It was promptly cancelled on rejection, and what I call a mercy claim was allowed in order to appease one of that class of inventors, of which there are many, who too often discover that the ancients have stolen many of our modern inventions. The claim allowed this disappointed inventor was the specific one now found in the patent.

I here present a certified copy of Hambrook's file-wrapper, and designate it "Defendant's Exhibit Hambrook File-wrapper."

The claim of the patent reads:

"In combination with the provision chambers, D, D, the ice-chamber, C, having rack c^1, and double-inclined bottom pieces, x, y, provided with a central opening guarded by the deflector plate, K, and provided, also, with the side passage, c, from the provision chamber and the trough, z, and pipe, z, all substantially as described and shown for the purpose set forth."

The language of this claim is somewhat mixed up as to plural and singular, but I cannot see as any material harm is done. Each of the elements of this claim were old in the refrigerator art. Each element before performed precisely the full office it performs in the construction of refrigerator described in the patent. No new office or degree of office is given to any element by reason of the association in which it is found in the Hambrook construction. The claim is merely a schedule of elements in association, each element performing its old office in its old way and arranged in its old manner. There is an absolute lack of the very essence of combination as distinguished from aggregation. I do not say this in a spirit of construing the claim, but simply as an intelligent mechanic viewing the association of elements recited.

Therefore, and for the reasons I have given, I must answer your question by saying that in my opinion, in view of the prior state of the art, the alleged invention referred to, and particularly pointed out in the Hambrook patent, is absolutely without novelty.

480 Q. 6. Do you find or do you not find in defendant's refrigerator the invention particularly pointed out and described in the Hambrook patent No. 204,216? Please give reasons for any opinion that you may express.

A. I do not find embodied in defendant's refrigerator even the matter that is claimed in the Hambrook patent. Defendant's refrigerator and the construction described in the Hambrook patent are both founded on the same prior state of the art, but they differ from each other in certain details of construction to a greater degree than the Hambrook construction differs from what is found in the prior art.

It might be well for me to compare defendant's refrigerator with the Hambrook claim, element by element.

The first element in the claim is "the provision chambers B B." They are provision chambers below the ice, as in the old patents. This element is also found in defendant's refrigerator.

The second element of the claim is "the ice-chamber C." This chamber is in the top of the refrigerator, above the provision chamber, as in the older patents. This element is also found in defendant's refrigerator.

The next element of the claim is the "rack c^1." This rack is merely the perforated ice-rest of the ice-chamber, as in the older patents. It is not found in defendant's refrigerator, in which the ice is carried on an imperforate plate of corrugated metal, as found in certain older patents. No water can drip through the plate which supports the ice in defendant's refrigerator.

The next element of the claim is the "double-inclined bottom pieces *x* and *y*." This element is not found in defendant's refrigerator, in which the ice-pan has no double incline, and does not slope to the center, but is nearly a dead-flat pan, with its rear edge set low enough to carry the water to that one of its edges where the waste pipe is connected.

481 Ice-pans with double inclines as in the Hambrook construction were taken bodily from the prior art, but defendant's refrigerator does not employ this construction.

The next element of the claim is "a central opening" as a provision of the bottom pieces. This opening is found in prior patents, and it is found in defendant's refrigerator.

The next element of the claim is "the deflector plate K" guarding the opening in the pan. This deflector, employed in the Hambrook patent to prevent water from the perforated ice-rack from passing down through the air openings, is found in numerous earlier patents, but it is not found in defendant's refrigerator. Defendant's refrigerator having no leaky or perforated ice-rest, has no need for a deflector over the opening in the ice-pan. It has no more use for this deflector than a man would have for an umbrella raised in a house that did not have a leaky roof. But the non-condensing plate invented by Law in 1867 is employed in defendant's refrigerator, and for the same purpose. Air coming in contact with the cold ice-rest might condense and sweat, as explained by Mr. Law. Defendant applies under his corrugated ice support the insulating plate of Law's; in fact the ice support in defendant's refrigerator is the identical ice support which was patented by Law in 1867, and which became the property of defendants, as a part of the public, on the expiration of that patent. In embodying the

Law invention, the defendants have left off the non-condensing plate at points where condensation can drip into the pan. Hambrook had the perforated ice-rest and employed the old deflector to protect the air openings from drip therefrom. With such an ice-rest the non-condensing system invented by Law would be valueless, as the cold ice water would keep the non-condensing plate always cold. Defendant uses an ice-rest which does not rain, having no perforations, and can thus use the invention of Law, but has no use for the umbrella. The plate of Law in the Ham-
482 brook construction would be an absurdity, and the roofing deflector in defendant's construction would be an equal absurdity.

The next element of the claim is "side passage *c* from the provision chamber." This is the old uptake passage of the earlier patents, even the earliest I have referred to, one of them in a single-barreled Lyman refrigerator, and two of them in a double-barreled Lyman. Hambrook shows two of these passages, and recites but one in the claim. He must have two if he has two provision chambers, if he runs the dividing partition clear to the roof of the box, as he mentioned may be done. However that may be, this passage is found in defendant's refrigerator.

The next element of the claim is "the trough *z*." This trough is a depressed gutter formed around the margin of the opening in the pan, and communicating with the waste pipe. It is found in numerous earlier patents. It is not found in defendant's refrigerator. Defendant has no gutter at all, and does not lead his waste pipe from the neighborhood of the central opening. On the contrary he simply margins the opening by the old system of an upturned flange. Defendant dispenses entirely with the gutter by the simple expedient of employing a dead-flat pan, and connecting the waste pipe to one edge of it, and then sloping the pan so the water will run to that edge.

The next element of the claim is the "pipe *z'*." Viewed as a mere waste pipe to carry away the drip-water, as in all the earlier refrigerators, then this element is found in defendant's refrigerator. Viewed as a vertical pipe, forked near its top, so as to collect from the two drain gutters or troughs, one trough on each side of a vertical partition, through which one branch of the waste pipe passes, then this element is not found in defendant's refrigerator. The pipe of the claim does not involve the peculiarity of branching, etc., for the claim does not say it does, and the specification says the connection is to be made by any suitable means.

Briefly, defendant's refrigerator does not contain the aggre-
483 gation recited in the claim of the Hambrook patent for the reason that it does not embody the same elements or arrangement, or mode of operation or result. As a mere example of difference, Hambrook has a leaky ice-rest and an umbrella-like deflector under the leak, and could not utilize the invention of Law. Defendant has an imperforate ice-rest, and needs no umbrella, and can and does utilize the invention of Law.

(Adjourned to Wednesday, Jan. 8, 1890.)

(Wednesday, January 8, met pursuant to adjournment.)

Q. 7. What, if any, opportunities have you had for becoming familiar with the measure of skill enjoyed by ordinary constructive mechanics?

A. As a boy I served my apprenticeship among them, and graduated into one of them; as a journeyman I was one of them and lived and worked with them; as a foreman I had them under my directions; as engineer and designer I had them carrying out my designs and suggestions, and as a consulting engineer to factories engaged in a het-rogenious line of industry I find that the measure of skill of these men is the ever-present given quantity with which I have to deal. The business of my life is with these men and their capacities.

Q. 8. Would it, in your opinion, in view of the prior state of the art, require more than the exercise of judicious selection and ordinary mechanical skill to produce the construction, particularly pointed out as the subject-matter of the Hambrook patent, in the specifications and drawings attached to said patent? You may give your reasons for any opinion you may express.

A. Most assuredly not. It having been old in the art to construct refrigerator boxes with non-conducting walls and doors, etc.; and it having been old to apportion therein the upper portion for the ice-chamber and the lower portion for provision chambers; and it having been old to secure air circulation by having the air passed cold from the ice down to the provisions, and then in a circuit up
484 to the ice again in a continuous round; and it having been old to form the floor of the ice-chamber of a perforated rack; and it having been old to provide uptake flues to pass the air from the provisions to the ice; and it having been old to dispose a drain-pan below the perforated ice-rack to catch the drip-water, and prevent falling into the provision chamber; and it having been old to provide such pan with drain-gutters and a waste pipe; and it having been old to put an opening in such pan for the downflow of air; and it having been old to guard the margins of such opening to restrain the flow of pan water; and it having been old to put a deflecting roof over such opening to keep the drip from descending through the opening; certainly nothing more than the exercise of judicious selection and ordinary mechanical skill would be required to produe the aggregated association particularly pointed out as the subject-matter of the Hambrook patent, to wit, a pair of provision chambers, an ice-chamber with a rack-bottom, double-inclined pans with an air opening between them, a deflector plate roofing such opening, uptake flues from provision chamber to ice-chamber, a trough at each side margin of the opening in the pan, and a waste pipe connected with said two troughs.

Q. 9. Have you read the testimony of Melville E. Dayton, an expert, who testified on behalf of the complainant in this case, and if so, how far do you agree or disagree with him upon the patent in suit and defendant's refrigerator as compared therewith?

A. I have read that deposition and wish to call attention to a few points therein.

In cross-question 25 Mr. Dayton was asked if there would be invention in making a double refrigerator in exact duality of a single one previously known. Hambrook, in his specification, says his partition, *a*, may run clear to the top of the box. This would cut the refrigerator squarely in two, and one half would be the same as the other half, and the two halves would work the same
485 whether they were contiguous or separated half a mile. The dual refrigerator structure thus defined in the Hambrook specification would have its two halves absolutely complete and independent. Mr. Dayton stated that there would be invention in bringing these two old refrigerators together. But he reached his wrong conclusion from a wrong reading of the patent. He says, "It is a characteristic of this unitary and single refrigerator of Hambrook's that it has a single central passage through the bottom of the ice-chamber for the downflow of cold air, and two passages, one at each side of the ice-chamber, for the upflow of the warmer air." The contrary is the case, for Hambrook's specification states, "If desirable, the ice-chamber may be divided into two parts by extending the partition, A, to the top of the ice-chamber and bisecting the curved apron, K, longitudinally." This, it will be seen, cuts the refrigerator in two and leaves each side absolutely complete in itself, each side being nearly a Lyman refrigerator. Not only has Mr. Dayton overlooked this language of Hambrook's specification, but he has misconstrued the construction actually shown in Hambrook's drawings, in which, instead of there being a single central opening to the provision chambers, there are two distinct and separate openings entirely separated by the partition *a*. This partition extends from the floor of the refrigerator to the ice-rack and forms the side walls for the two provision chambers, and instead of there being a single central opening to the provision chamber, there are two independent side openings, one at each inner side of each provision chamber.

In cross-answer 26 Mr. Dayton states that a wooden roof or deflector in Hambrook's construction would be the equivalent of the metal one described. In this I concur. The imperforate wooden part of the ice-rest of the Lyman patent which is located directly over the downtake passage, F, and restrains the dripping to that portion of the ice-rest directly over the catch-pan, is certainly the equivalent, for such purpose, of a similar imperforate part
486 made of metal. Such imperforate part is also found in the Smith patent.

In answer 27 Mr. Dayton states that the defendant's refrigerator would not be materially modified by substituting a flat wooden ice-rest in place of the corrugated metal one. Mr. Dayton here overlooks the fact that a wooden imperforate ice-rest would be a non-conductor and a non-condenser and would not call for and could not utilize the invention of Mr. Law, as is done in defendant's refrigerator. If, however, Mr. Dayton has reference merely to a perforated wooden ice-rest left unperforated directly over the air opening then he must refer to precisely the ice-rest set forth in the Smith patent, and must mean that the Hambrook patent covers a construc-

tion regardless of whether it has the perforated ice-rack and umbrella deflector of the Hambrook patent or the unperforated portion without the separate deflector as shown in the Smith patent. From this latter view I dissent, as the Hambrook claim specifically calls for an ice-rack, a rack being essentially an open-work affair, and a deflector in addition thereto to guard the air opening from the effect of the openings above it in the ice-rack.

In direct answer 6, Mr. Dayton institutes comparisons between defendant's refrigerator and an exhibit which has been put in the case as complainant's refrigerator, and in his comparisons he seems to go on the assumption that complainant's refrigerator is built in accordance with the Hambrook patent sued on. In this he is entirely wrong, as complainant's refrigerator is not the Hambrook refrigerator at all. There is a Hambrook refrigerator as an exhibit in the case, one of defendant's exhibits, and Mr. Dayton should have made his comparison with a real Hambrook refrigerator. Hambrook refrigerators have not been in the market for some years, their manufacture having been long since abandoned.

In direct answer 7, Mr. Dayton compares the elements of defendant's refrigerator with the elements of the Hambrook
487 claim, but he falls into numerous errors of conclusion. He says the horizontal partition or pan of defendant's refrigerator is divided into two parts by a central opening, and therefore answers to the double-inclined bottom pieces of the Hambrook claim. This is incorrect. Defendant's refrigerator has a single dead-flat drip-pan with an air-hole in it, instead of two inclined bottom pieces as in Hambrook. The pan, instead of having two inclines, as in Hambrook, and a waste pipe connecting with two gutters, has a mere drain slope towards one of its edges where the waste pipe is connected, defendant's construction thus dispensing entirely with the necessity for double inclines and for two gutters, and for a waste-pipe placed in connection with two gutters. Defendant's pan is the pan of the Smith patent precisely and not the double-inclined double-troughed pan of the Hambrook patent.

In the same answer, Mr. Dayton says defendant's metallic imperforate ice-rest is mechanically the same as the perforated ice-rack of the Hambrook patent. This is error. The Hambrook rack is perforated, defendant's is not; Hambrook's rack would rain ice-water into the air opening, defendant's could not; Hambrook would require an umbrella to keep the rain out, defendant's would not; Hambrook could not utilize Law's invention of non-condensing plate, defendant can and does; Hambrook employs an open rack to permit a free movement of air to and from all sides of the ice, and the first claim which he originally filed was drawn broadly for this feature, the claim being for "the combination of the open-work platform, c', with the ice-chamber C, for the purpose of holding the ice so that the air may circulate about it in all directions, substantially as described." Hambrook's ice was, so to speak, materialized in mid-air, the skeleton rest or support letting the air attack its bottom freely. Defendant does nothing of the kind, but lays the ice on an imperforate plate.

In the same answer, Mr. Dayton says, in effect, that any roof
488 or imperforate feature over the air opening is the equivalent of the curved deflector of the Hambrook claim. This is true, I think, viewing the deflector alone, but Mr. Dayton has, in his deposition generally, emphasized the fact that the Hambrook elements must not be viewed alone but that the association must be looked at in its entirety. This is probably true, and with this view, the deflector of Hambrook should not be viewed aside from the open-work ice-rest above it, which renders its presence necessary. In the same answer, foot of page 22, Mr. Dayton says the complainant's refrigerator is constructed under the Hambrook patent. This is wrong. I do not believe present complainants have ever constructed Hambrook's refrigerator.

Regarding this feature of the open-work ice-rack of Hambrook, treated as impo tant in his specification, and recited in the present claim, and made the subject-matter especially and solely of the first claim originally filed, expert Smith, on behalf of complainants, says on page 77, after quoting from the Hambrook specification, that "the air will impinge upon the top, bottom and sides of the ice," "the word impinge I think is important."

The same witness, Smith, on page 79, seems to fall into the error that the deflector, K, of Hambrook has something to do with condensation, and uses the language "condensation or drip from the ice." He overlooks the fact that drip-water from the ice is not condensation at all, and that that drip-water is what the deflector of Hambrook deals with by a performance done entirely by its upper surface, acting as a shed roof. The treatment of condensation is an entirely different matter and has to do with the warm air coming from the provision chamber entirely, and is dealt with by the under side of a non-condensing plate. It is the invention of Law, and has nothing to do with the Hambrook patent.

Q. 10. Have you examined and do you understand the construction of the complainant's refrigerator as illustrated by the two
489 refrigerators offered in evidence by the defendant in this suit and marked respectively, "Defendant's Exhibit Buhl Refrigerator," and "Defendant's Exhibit Spear & Converse Refrigerator"?

A. Yes, sir.

Q. 11. You may state whether or not said refrigerators or either of them contain the supposed invention particularly described in the specification and drawings of the Hambrook patent, giving at length your reasons for any opinion you may express.

A. These complainant's refrigerators are not the refrigerators of the Hambrook patent. The rack c', of the Hambrook patent is not employed, and instead thereof there is employed an imperforate corrugated plate and non-condensing plate of the Law patent. There being no holes in the ice-rest for the rain to fall through, there is no umbrella, the deflector plate K, of the Hambrook patent, being entirely absent. Instead of the bottom pieces, x and y, with double inclines to the center as in Hambrook, the complainants have a dead-flat drip-pan, sloped to one edge where the waste

pipe is connected; they use the identical drip-pan of the Smith patent. The troughs of Hambrook are entirely dispensed with, the drip-water, instead of going toward the center to two gutters, going to the single low edge of the pan. Instead of the pipe, *z*, of Hambrook connected in any manner with the two central gutters of Hambrook, complainant's refrigerators have nothing but a simple single drain-pipe connected with the single lower edge of the dead-flat drip-pan, precisely as in the Smith patent.

Defendant here offers in evidence copies of patents as set out in the following schedule, the same being the patents referred to by the above witness in illustrating the state of the art, and ask that the copies be marked as indicated in the schedule preceded by the words, "Defendant's Exhibit. Banta patent 60665, of 1867."

490 Koch patent 77624, of 1868; Chase patent 95428, of 1869; Little patent 129,671, of 1872; Harris patent 61734, of 1867; Law patent 62643, of 1867; Page patent 174,143, of 1876; Rohrer patent 121,899, of 1871; Yost patent 23803, of 1859; Hunt patent, reissue, 47859, of 1872; Butler patent 161,928, of 1875; Lyman patent 14510, of 1856; Smith patent 193,563, of 1877; Sanford patent 13802, of 1855.

Also the models referred to by this witness, the same to be marked as he has designated in his testimony, said models being as follows: Defendant's Exhibit Page Model; Defendant's Exhibit Rohrer Model; Defendant's Exhibit Hunt Model.

Also the certified copy of the Hambrook file-wrapper referred to by the witness, the same to be marked Defendant's Exhibit Hambrook File-wrapper.

Also a copy of reissue patent 8463 of Oct. 22, 1878, the same being a reissue of the Smith patent 193,563 of 1877, referred to by the witness, said reissue patent to be marked Defendant's Exhibit Smith Reissue Patent 8463.

Also copy of Sanford's reissue patent 455 of 1857, the same being a reissue of the Sanford patent 13802 referred to by the witness, said reissue patent to be marked Defendant's Exhibit Sanford Reissue Patent 455.

The exhibits offered in connection with the testimony of this witness are received and marked as above designated.

Counsel for complainant, The Belding M'f'g Co., here objects to each and every of said exhibits of copies of patents and of models as irrelevant, incompetent and immaterial.

Q. 12. Have you examined refrigerators purporting to have been manufactured by the Belding M'f'g Co. so that you will be able to state whether or not such refrigerators contain the same construction as the refrigerators offered in evidence marked "Defendant's Exhibit the Buhl Refrigerator," and "Defendant's Exhibit

491 the Spear & Converse Refrigerator"? If so, you may state when and where you examined them, and how they were marked or stenciled.

A. Yes, sir. I have examined them at a hardware store in Grand Rapids having quite a stock of refrigerators of various sizes, and

among others examined duplicates of the two exhibits here referred to. They were marked as of the manufacture of the Belding M'f'g Co. and bore the legend "New Perfection."

Q. 13. You may state whether or not in your opinion there is such an outward similarity in appearance between the defendant's refrigerator and the complainant's refrigerator as would have a tendency to mislead a person who desired to purchase a complainant's refrigerator?

A. Certainly not. The origin of a refrigerator is not to be judged by its mere architecture, all refrigerators presenting generally similar appearances. Refrigerators all take on the form of more or less ornate pieces of cabinet-work, and they resemble each other as two barrels of flour resemble each other. If the purchaser is interested in the origin of the refrigerator he buys he must do the same as he would do with flour—he must look for the maker's name. It would be imposible, within reason, to more clearly distinguish the two manufacturers from each other. Complainants call their refrigerator the New Perfection, and defendants call theirs the Challenge Iceberg. Complainants label their refrigerator as of the manufacture of the Belding M'f'g Co., and defendants label theirs as of the manufacture of the Challenge Corn Planter Co. Complainants label theirs as coming from Belding, Mich., and defendants label theirs as coming from Grand Haven, Mich. No clearer commercial distinction could be given. All has been done that is usual in commercial markets. The maker of flour, and the maker of nails, and the canner of fruit labels his goods to indicate their origin, to distinguish them from goods originating elsewhere. Defendants
492 have done the same fully. In the architectural treatment there are slight differences, but this is purely a question of taste in ornamentation. Complainants put brackets at the tops of the corner pilasters. Defendants do not. Defendants put engraved panels in the doors, etc., while the complainant does not. As a general thing, however, all refrigerators in the market present exterior characteristics of similarity, like trunks and wardrobes and box cars and the like. Manufacturers do not seem to attempt any broad originality of design in these matters, or to adopt any proprietary characteristics.

Counsel for the Belding M'f'g Co. here objects to all of the foregoing questions calling for, and objects to all answers or parts of answers giving the opinion of the witness on the question of patentability and of infringement; and to all answers not confined to the comparison of mechanisms and the modes of operation of mechanisms present in models or shown in drawings with other mechanisms similarly shown, and to all answers not confined to a statement of the witness's knowledge of the state of the art, on the ground that such testimony here objected to is not proper expert testimony, and in giving such the witness has attempted to instruct the court on questions of law.

In the absence from this place of examination of the identical refrigerators offered in evidence by the respective parties, the witness

has examined what purports to be duplicates of said exhibit refrigerators. Counsel for complainant here admits that the testimony of the witness based upon an examination of such duplicates may be used with the same force and effect as though based upon an actual examination of said original exhibits.

(Adjourned to 1.30 p. m.)

(1.30 p. m. met pursuant to adjournment.)

Cross-examination by Mr. BROWN:

C. Q. 1. What is the area of the opening at the bottom of the two uptake flues *c c* of the Hambrook patent as compared with the area of the central opening in the bottom of the ice-chamber?

493 A. Hambrook gives absolutely no information on that point, and the drawings furnish no information. If it was known to a certainty that all these openings extended from front to rear of the refrigerator, then Fig. 2 of Hambrook's patent would enable us to judge of areas, and we would say that the central opening, taking both sides of the partition, had about twice the area of each of the side passages, *c*. In other words, the room between the partition and the gutter for the air to pass down is substantially the same as the room allowed in corresponding passage, *c*, for it to pass up. This presumes that the central opening extends from front to rear of the refrigerator, and this was probably Hambrook's intention, for he says the bottom pieces extend from front to rear. I think that is the construction found in the old Hambrook refrigerator now an exhibit. That is the best answer I can make to your question. But if this central opening is by any means made shorter than the entire pan, shorter than the entire depth of the refrigerator from front to rear, then of course we can tell nothing of comparative areas until we know just how long that central opening is. For instance, in the Smith patent the air-hole through the pan is a mere aperture extending to neither the front or rear side of the pan. In defendant's refrigerators, and in complainant's refrigerators, the Smith construction of ice-pan has been adopted. In defendant's refrigerator the air-hole in the pan has a length equal to about two-thirds of the depth of the refrigerator.

C. Q. 2. In your opinion which would be the better refrigerator in its mechanical construction and mode of operation, one where the central opening permitting the exit of air from the ice-chamber is less than the area of the openings permitting the inflow of air from the uptake flues to the ice-chambers, or a refrigerator having the opposite construction?

494 A. I had a great deal of experience in connection with refrigerators, having spent a great deal of time in connection with refrigerator cars. I was for a long time consulting engineer and vice-president of a refrigerator-car company, and am now, and I devoted much time to close inquiry into these matters. I long ago concluded that the theories in connection with air volumes, etc., in refrigerators were little more than theories. I cannot, therefore, give you anything more than a theoretical opinion.

The volume of air which goes from the provision chamber to the ice gets smaller, contracting by decreasing temperature. This air, when it reaches the provision chamber again, expands again. Therefore, the volume of air to go through the up flues is greater than the volume of air to go down through the hole in the ice-pan. Therefore, the area of the down hole may be made less than the area of the uptake.

But, aside from this, there are two distinct theories urged by those working with refrigerators, and with air under temperature generally. One theory is that the best results are produced by circulating the air rapidly, effecting but slight changes in its temperature during circulation. This means to have the passages very large. The other theory is to move the air very slowly and hold it so long in connection with the ice as to effect great changes in its temperature. This means to choke down or contract the area of the hole in the ice-pan, and it means that the air will leave the ice slowly and get much colder than by the first theory. The first theory calls for a big hole in the ice-pan, and the second theory for a contracted opening. I would give no preference to either theory, though I would incline, I think, toward the latter theory. The same diverging theories held good in heating houses by furnaces. Shall the air conduits be so arranged as to pass into the house a small volume of air highly heated, or a large volume but slightly heated, the total units of heating injected being the same in either case? In house-heating I incline to the large volume slightly heated.

495 C. Q. 3. What do you understand to be an equivalent of an element of a combination set forth in a claim of a patent?

A. Given an element in a claimed combination, and given its mode of operation and result in the combination, an equivalent of that element is another instrumentality previously recognized as having, under analogous conditions, the same mode of operation and capacity for the same result.

C. Q. 4. Name, then, such a recognized equivalent for any of the elements of the claim of the Hambrook patent as may have equivalents.

A. Take Hambrook's provision chambers. Equivalent is any two chambers in a refrigerator having the same capacity, to wit, to have an ice-chamber above, to contain provisions, to discharge air upwardly to the ice-chamber, and to receive air down again from the ice-chamber. Prior patents are full of equivalents.

Take the ice-chamber, C, of the Hambrook claim. Any chamber is its equivalent which has the capacity for containing ice and receiving air from below and discharging it to below. Prior patents are full of equivalents.

Take the rack, c', of Hambrook. Anything is its equivalent which will form a perforated floor for the ice-chamber to sustain the ice without interfering with the air attacking the ice on all sides. Prior patents are full of equivalents.

Take the double-inclined bottom piecss, x and y, of Hambrook. Anything is the equivalent which has the form of a pair of ice-pans

disposed below the perforated rack and draining by double inclines toward a common central point. The references show numerous equivalents.

Take the central opening of Hambrook. Any opening in the ice-pan to permit the downflow of air from the ice to the provision chamber is its equivalent. Prior patents are full of equivalents.

496 Take the deflector plate, K, of Hambrook, which guards this central opening. Anything would be the equivalent of this deflector which was disposed under rain holes in a perforated ice-rack and over an air opening to be guarded from that rain fall. The prior patents are full of equivalents.

Take the side passages, *c*, of Hambrook. Anything would be the equivalent of them which would permit the warmer air to flow from the provision chamber to the ice-chamber. The prior patents are full of equivalents.

Take the troughs, *z*, of Hambrook. Anything is the equivalent of them which is arranged at the lower edges of sloping ice-pans and serves at once to restrain the side flow of pan water to the opening which they margin and to serve as gutters to carry this water to a common point of discharge. The prior patents are full of equivalents.

Take the pipe, *z'*, of Hambrook. Any drain-pipe in a refrigerator is the equivalent which communicates with concentrating troughs on the ice-pans and conducts the water to outside the refrigerator. Prior patents are full of equivalents.

When I state that prior patents are full of equivalents, I mean to say that prior patents show, not only equivalents for the elements named, but the identical recited elements themselves.

When you ask me about equivalents of the elements recited in a patent claim, and when I gave you my definition, I should have explained that my understanding was that equivalents of elements in a claim are involved only when the patentee gives us something new, when he is a pioneer in his line. In my opinion the matter of equivalents is an idle consideration in connection with the matter now under inquiry, the Hambrook patent.

C. Q. 5. With this opinion as just expressed you wish the court to understand, do you, that a claim for a combination of old elements arranged in a new way to produce a new and useful

497 result, such claim not covering what you have termed a pioneer invention, would not embrace a construction similar to that described in the claim where one or more of the elements was supplanted by a well-known and recognized equivalent for such element?

A. You misunderstand me. My view is directly the contrary. The inventor of a combination is always entitled to equivalents. He is a pioneer by having invented the combination. But he must be the inventor of a combination. Invention is presupposed, and a true combination is presupposed. If there is no true combination, or no invention about the association, then the doctrine of equiva-

lents is not available. This may be outside my province, but I give you the opinion for what it may be worth.

C. Q. 6. Upon the supposition that the invention disclosed and claimed in the Hambrook patent was novel at the date of said patent, and that the latter is therefore valid to cover said invention, state whether or not in your opinion said claim includes a similar construction to the one therein described, having, however, one or more of the elements of the claim supplanted in this other construction by a well-known mechanical equivalent of such elements?

A. I cannot answer your question directly as put, for I cannot be uninfluenced by the obvious fact that there is no invention and no combination about this Hambrook affair. I therefore cannot answer upon the supposition that there is. But I can make you a general answer. Any valid combination is responded to by any combination containing all of the recited elements, or by any combination containing some of the recited elements and mechanical equivalents for the balance of the elements. It would not be responded to by any combination having a lesser number of elements. Omit an element, and substitute no equivalent for it, and you have not the same combination, even if identical results are produced.

You have another invention of superior merit in that it pro-
498 duces the same result with a lesser number of elements. This itself has always been recognized as constituting a new and patentable invention, never to be dominated by a patented invention which it thus improves upon. More patent law you will notice.

Answer objected to as not responsive.

C. Q. 7. Like which one of the patents of the prior art hereinbefore referred to is the Complainant's Exhibit Defendant's Refrigerator No. 1 in its interior arrangement and mode of operation?

A. It does not respond in all details to any patent which I have ever seen. In general construction it approaches quite a number of them. It is nearer to the Smith patent than anything else, the only difference being in the point of inlet from the uptakes to the ice, and in the ice-rest. The uptake of the Lyman patent has been employed instead of the overtop terminal of the Smith patent. The imperforate corrugated metallic ice-rest with non-condensing plate of the Law patent has been adopted instead of the perforated wooden ice-rest of the Smith patent.

Absolutely nothing of the Hambrook claim has been taken in the defendant's refrigerator. There is nothing in defendant's refrigerator which cannot be read of in prior patents better than it can be read of in the Hambrook claim.

C. Q. 8. What is the function of the flat metal plate attached to the bottom of defendant's ice-rack?

A. It is designed to prevent the air that rises from the provision chamber from having its moisture condensed by coming in contact with the cold under side of the plate that supports the ice, and thus dropping back into the said provision chamber and injuring its contents. I quote verbatim from the Law patent.

C. Q. 9. Could a plate similar in construction be used in the construction illustrated in the Smith reissued patent with the same effect?

499 A. In the Smith patent it is stated that the ice-rest is formed of wood, covered on its upper surface with zinc. In such construction the ascending air would strike the comparatively warm wood and would never be subject to the condensation which it is the function of this plate to guard against. Therefore such plate, for such office, would be useless.

C. Q. 10. State whether or not a single as well as a double provision chamber is embraced in the term of the claim of the Hambrook patent?

A. The two provision chambers are specifically recited in the claim, and, as I understand patent law, you cannot read out of a claim elements which an inventor or supposed inventor has specifically recited therein. I understand that in cases additional elements may be read into a claim. Both provision chambers are involved in the Hambrook claim.

C. Q. 11. Do you understand that the claim of the Hambrook patent will not embrace a drain-tube other than the forked tube shown therein as connecting with the two troughs or gutters?

A. I do not understand that the claim is so limited, for the claim does not recite such limit. It would seem only essential that there should be two gutters to carry water along toward the tube and that the tube should be connected in any suitable manner with these gutters. The Hambrook patent shows two ways of making the connection, one by branching the tube to the two gutters, and the other by discharging the two gutters into a recess, *s*, acting substantially like a funnel at the top of the tube.

C. Q. 12. You have stated that any chamber having the capacity for containing ice, and receiving air from below and discharging it to below is the equivalent of the ice-chamber C of the Hambrook claim. Would it make any difference whether the bottom of the ice-chamber was substantially horizontal or slightly inclined toward either the front or rear or whether it was inclined from each

500 end towards the center, so far as the operation of the ice-chamber itself is concerned?

A. In my remarks on the ice-chamber of the Hambrook claim I treated it as an element by itself, but you will understand, of course, that a chamber is a nonenity, the material boundaries of that chamber being the material element. I have treated the ice-rack, which is the floor of that chamber, as a separate element, in order to deal definitely with the language of the claim. This is the element you now inquire about. It would make no difference, so far as I could see, whether this rack were level or sloped a trifle in any direction.

C. Q. 13. Suppose there was no ice-rack in the chamber C, the ice being suspended, we will say, from the roof of the chamber. In such case the double-inclined bottom pieces, *x* and *y*, would be the bottom of the ice-chamber. Would not such ice-chamber find its equivalent in a similar construction where the bottom pieces were

less inclined than they are shown in the Hambrook patent, as, for example, in the defendant's construction with the ice-rack removed?

A. No sir. The assumed construction takes out an element of the chamber, namely its perforated floor, for which the suspension is not an equivalent. I do not understand even then what the change would have to do with the fitness or unfitness of a change in the slope of the two inclined bottom pieces. However that may be, the dead-flat board with one slope would never be the equivalent of the double bottom with two inclines. It might perform the same office, and perform it very much better, but it would not thereby become the mechanical equivalent of the poorer multiplicity of elements comprised in Hambrook's two bottom pieces inclined in different planes and requiring two gutters extending from front to rear of the refrigerator, and a branching, or funnel, or some similar contrivance to connect these two gutters to the waste pipe.

501 C. Q. 14. Do you regard any construction of refrigerator set forth in any of the prior patents which has one or more openings or passages other than the doors, through which external air may be admitted to the interior of the refrigerator, as embracing the same arrangement or mode of operation that is present in the defendant's construction Complainant's Exhibit Defendant's Refrigerator No. 1?

A. The circulating system in defendant's refrigerator is the system invented by Lyman. Other inventors, among the reference patents, have clung to a system involving the admission of fresh air, but the additional openings have generally had registers or the like to regulate or close them.

Take defendant's refrigerator and supply it with fresh-air openings having registers. These openings may modify the ventilating system out of all correspondence with the Lyman principle. Contract them somewhat and the Lyman system may prevail. Close them and the Lyman system holds full sway.

C. Q. 15. Then your answer to my question is no, as I understand it?

A. It was yes and no. I may make the answer more definite by saying that external openings sufficiently large would prevent the realization of the Lyman system in defendant's refrigerator.

C. Q. 16. Such openings, if made in defendant's refrigerator, would change its mode of operation from that found in said refrigerator as at present constructed, would it not?

A. If large enough, yes; but I am not prepared to say how much of an opening it would take to interfere with the intended performance. Any opening whatever would tend towards such prevention.

C. Q. 17. Is not this equally true with respect to the construction disclosed in the Hambrook patent?

A. Certainly. The refrigerator of the Hambrook patent is
502 the Lyman system identically, there being no difference whatever except in the choice of height in the provision chamber at which the down-coming air shall be discharged, Lyman

preferring a low point, while Hambrook, like many earlier adopters of the Lyman system, preferred a high point.

C. Q. 18. Which single patent, prior to the Hambrook patent, discloses all the elements of the claim of the Hambrook patent, arranged and operating in the same manner pointed out in said Hambrook patent?

A. I do not think any prior patent would describe the identical construction recited in the Hambrook claim. But if any elasticity is to be allowed in reading the elements, anything like the elasticity required to make defendant's refrigerator respond to the claim, then the Smith patent might be said to respond. But, as before stated, I do not think you will find anything to respond to this Hambrook claim, or ever will until some one sees fit to again put on the market the Hambrook refrigerator, which is not at all likely, more simple and perfect constructions having long since driven the Hambrook construction out of the market.

C. Q. 19. Point out with particularity the elements of the claim of the Hambrook patent which, or their several equivalents operating in the same manner, you find present in the construction shown in the said Smith patent?

A. I can only do this, you understand, by adopting the same system as employed by Mr. Dayton in comparing the Hambrook with later refrigerators, like defendant's refrigerator. On that plan I will proceed.

For the provision chambers B B of Hambrook, see the provision chambers E^1 of Smith; same in all respects.

For the ice-chamber C of Hambrook, see the ice-chamber D of Smith; same in all respects, except as to attributes hereafter to be referred to.

For the rack c^1 of Hambrook see ice-rest I of Smith, a
503 horizontal perforated wooden structure to form the floor of the ice-chamber and support the ice and let the air and drip-water pass down.

For the double-inclined bottom pieces x and y of Hambrook see the horizontal partition D^1 of Smith. This partition is precisely like the dead-flat pan in defendant's refrigerator, which Mr. Dayton says is the mechanical equivalent of these elements in the Hambrook claim.

For the central opening between the inclined bottom pieces of Hambrook, see the opening d in Smith, which is just like the one in defendant's refrigerator which Mr. Dayton says is the equivalent of the opening of the claim.

For the deflector plate K of the claim, see the imperforated portion of the ice-rest directly over the air opening d in Smith, doing just exactly what Mr. Dayton says it is the duty of the zinc plate in defendant's refrigerator, namely, guard against ice-drip falling down through this central air opening.

For the side passages c from the provision chamber of the Hambrook claim, see the same passages F and F^1 of the Smith patent, passages arranged at the side and leading from the provision chamber, and intended to convey the warmer air to the ice-chamber.

For the trough z of the Hambrook claim see anything you can find about the Smith patent to prevent the pan water from falling through the air hole, the construction being precisely the same in the Smith patent and in defendant's refrigerator.

For the pipe z^1 of the Hambrook claim see the waste pipe H of Smith, which is identical with the pipe in defendant's refrigerator.

C. Q. 20. And each of the elements of the Smith patent perform the same function, do they, as the elements of the Hambrook patent to which you say they severally correspond?

A. On Mr. Dayton's plan of comparison, yes. On my own
504 plan, which seems to me more reasonable, no. There are no gutters of Hambrook in the patent of Smith. There are no double-inclined bottom pieces of Hambrook in the patent of Smith. There is no umbrella deflector of Hambrook in the patent of Smith; but there are substitutes, not for the elements exactly, but for the performance of them. Thus by omitting the perforations in the ice-rack over the air hole the umbrella is not needed. By omitting the double-inclined bottom pieces the gutters are not needed. By omitting the two gutters a double connection to the waste pipe is not needed. I would put it this way: There is no performance of any utility provided for in the Hambrook construction which is not provided for in the Smith patent. Necessities found in the Hambrook patent are omitted in the Smith patent.

C. Q. 21. Given a construction of the Hambrook patent, state whether or not it would require anything more than the exercise of mechanical skill to change that construction into the form present in either Complainant's Exhibit Belding Refrigerator or Complainant's Exhibit Defendant's Refrigerator No. 1, which appear to be the same in interior construction and arrangement?

A. Your question involves the prior art, of course, and I unhesitatingly answer that it would not. In my opinion, it would not require more than ordinary skill to produce those structures, regardless of the Hambrook patent. I do not see that the Hambrook patent has been an element in the formation of those structures.

C. Q. 22. State whether or not in your opinion a refrigerator constructed in accordance with the Hambrook patent would be an operative refrigerator.

A. Most certainly, but in my opinion it would possess many of the characteristics of a first-class nuisance. Pieces of ice and that indescribable filth found in all ice-boxes would go down through the perforated ice-rack and would lodge under the eaves of the deflector and in the gutters, and would be very difficult to clean, as would be apparent at once from an inspection of the Hambrook re-
505 frigerator made an exhibit in this case. It would be greatly improved by attaching the deflector to the ice-rack, but then the deflector would be quite apt to get destroyed when the ice-rack was removed and laid down for cleaning. The gutters would be nasty things any way you could fix it. As a practical user of refrigerators, I would say that if I had one of them I would consider it very much improved by tearing out every little Hambrook detail of the machine, and substituting therefor the more admirable con-

trivances found in prior patents, as exemplified, for instance, in the more modern refrigerators as built by quite a number of manufacturers. The old constructions embodied in defendant's refrigerators, and in complainant's refrigerators to-day are in my opinion far superior to the Hambrook details which they have supplanted in the market. Examine the exhibit refrigerator. Lift out the ice-rack of the old Hambrook refrigerator and notice what you see to catch foul stuff and be cleaned. Lift the ice-plate out of defendant's refrigerator, and notice the plain, simple surface to be cleaned. Do the same with complainant's refrigerator. In my opinion, neither complainant nor defendant would have any fear whatever from a competitor building the Hambrook refrigerator. I do not believe a market could be made for them to-day.

C. Q. 23. What reason have you for justifying your statement that the modern refrigerators have supplanted the Hambrook and forced refrigerators of the Hambrook construction out of the market?

A. I have been professionally connected for some years with the refrigerator business. I have not seen a Hambrook refrigerator in the market for quite a number of years. I understand the attempt to market them resulted in disaster to all who attempted it, though I may be wrong about this. I know the requirements of the market, and I know that it runs toward simplicity so as to prevent fouling as far as possible, and facilitate cleaning. I know
506 modern refrigerators by adopting constructions of prior date to Hambrook have got much that is admirable in this way. I know the Hambrook refrigerator has all that is abominable in this way. These are my reasons.

JAMES W. SEE.

(Adjourned to Thursday, Jan. 9.)

(Thursday, Jan. 9, met pursuant to adjournment.)

LEVI SCOFIELD, a witness on behalf of the defendant to the original bill and the complainant in the cross-bill, being first duly sworn to tell the truth, the whole truth, and nothing but the truth in said cause, says in answer to interrogatories propounded by Mr. TAGGART, as follows:

Q. 1. State your name, age, residence and occupation.

A. Levi Scofield, 63, superintendent of Challenge Corn Planter Co., residence Grand Haven.

Q. 2. How long have you been engaged with the Challenge Corn Planter Co.?

A. Since their organization which, I think, was in 1881, previous to which I was engaged with the Wait M'f'g Co. from 1871, with the exception of two years when I was with the Star Wagon Co. at Cedar Rapids, Iowa.

Q. 3. In what business or in what line of manufacture is the Challenge Corn Planter Co. engaged?

A. They are manufacturing corn-planters and refrigerators.

Q. 4. At what time did the managers of the Challenge Co. first

consider the desirability of manufacturing refrigerators? And at what time did it actually begin to manufacture refrigerators?

A. Immediately after the formation of the Challenge Corn Planter Co. I was instructed, as general manager and superintendent of said company, to look up some additional article to add to our list of manufactures. In 1885 we decided to commence the manufacture of refrigerators.

Q. 5. Prior to manufacturing refrigerators, what steps, if any, were taken by the managers of your company towards looking up and examining into the refrigerator business?

507 A. My position as superintendent to the Challenge Corn Planter Co. rendered it necessary for me to travel a great deal. I visited the larger cities in the West and also attended the agricultural State fairs throughout the country. In 1884, among other places, I visited Michigan City and examined the Alaska refrigerator, with which I was somewhat familiar prior to that time. I was shown through their works and took points regarding the manufacture of refrigerators. During 1884 I visited these works three separate times, and was careful to note at each time any patent marks that might be placed upon these goods. Wherever I saw a refrigerator on the market I examined it carefully with a view of ascertaining under what patent it might be constructed. I examined a large number of the New Perfection refrigerators in Chicago for the purpose of ascertaining how they were constructed, and particularly to see if there were any patent marks placed upon them. In 1885 we had correspondence and negotiations with the Lovell Bros., of Ionia, Mich., in regard to manufacturing a refrigerator under their patent. While these negotiations were pending suit was commenced against the Lovell Bros. for infringement of some other patents. We immediately abandoned the negotiations and decided not to manufacture the Lovell refrigerator. About August, 1885, I went to the Belding M'f'g Co.'s factory at Belding, Mich., and there had a talk with Mr. F. E. Ranney. I looked through the factory carefully, as I was allowed to go through and see everything they had manufactured or was in process of manufacture. I probably remained about the factory for three hours. I had examined a large number of refrigerators before this date; had examined the state of the art for the purpose of ascertaining what was patented and what was not, and I examined closely to see if the Belding Co. had any patent marks of any kind upon their refrigerators. So far as I could learn they had none. I called the attention of Mr. Ranney to the fact that there was no patent mark on any of these refrigerators.

He at first paid no attention to my remark. The second time I
508 asked him if the New Perfection refrigerator was claimed to be manufactured under any patent. His answer in substance was as follows: "We originally manufactured the Hambrook refrigerator, also the Booth & Osgood refrigerator, but we have made an entire new refrigerator outside and in, which we call the New Perfection. The reason why there is no patent mark placed on them I cannot tell, unless it be because they are not patented, as they are certainly very different from the original Hambrook re-

frigerator." He was very decided in his answer to this question, and in some further remarks he said that the Hambrook refrigerator had proved a failure and busted up two companies, and it was not worth while to manufacture it now. My sole object in asking these questions was to ascertain if the Belding M'f'g Co. claimed to be manufacturing this refrigerator under any patents. This enables me to be positive in what I say, as we had fully determined not to manufacture any refrigerator whereby we might get into patent litigation. Mr. Ranney, during our conversation, asked me what line of goods we were manufacturing at Grand Haven, and whether we intended to manufacture refrigerators. I told him that we had had had considerable talk with the Lovell Bros., of Ionia, about manufacturing their refrigerators, but that they had got into litigation and we did not care to go into a lawsuit; we therefore should not manufacture the Lovell refrigerator. I did not say to him at that time that we should not manufacture any refrigerator. I asked Mr. Ranney to explain to me the difference between the Hambrook refrigerator and the New Perfection. He answered, in effect, that the New Perfection refrigerator was finished very much different on the outside, and that the New Perfection refrigerator would keep and preserve articles stored therein dry, while the Hambrook refrigerator was moist and damp and would not preserve things stored therein. I asked Mr. Ranney what difference there was between
509 the New Perfection refrigerator and the Alaska refrigerator, they being very similar in appearance. He explained that practically there was no difference, as the Alaska took the warm air into the ice-chamber at the top, while the New Perfection took it in at the ends in two places instead of one, as in the Alaska. We had some conversation at that time in relation to a threatened lawsuit. I stated to him that I had heard that the Alaska people were going to bring suit against them for infringement. His reply was, "Our people have looked this matter up thoroughly and have no fears of a suit." Mr. Ranney at that time gave me an 1885 catalogue of the Belding refrigerator. I noticed the refrigerators particularly that were finished and in the packing-room. They had no patent mark upon them, but the finished ones were stenciled on the back with the number and the words, "New Perfection, manufactured by the Belding M'f'g Co., Belding, Mich." In November following I again visited the shops, at which time I spent two or three hours there, part of the time in the office and part of the time in the shops, at which time I purchased a refrigerator which was afterwards shipped to me at Grand Haven, Mich. That refrigerator was what they term a No. 3 refrigerator, and was stenciled on the back with the number and the New Perfection, manufactured by the Belding M'f'g Co., Belding, Mich. It also had a plate on the front marked "New Perfection, manufactured by the Belding M'f'g Co., Belding, Mich." That was all there was on it, there being no mark to indicate that it was patented. In June, 1886, I visited Ionia, Mich., and there examined some New Perfection refrigerators, and for the first time found a patent mark placed on them. Some of the refrigerators in stock were marked patented and some were not.

Q. 6. You may state whether or not you have ever had any experience in patent matters as inventor or otherwise, and whether you have had any experience, and if so what, of patented devices and machines.

510 A. I have taken out something over thirty patents of my own invention. I have always dictated to my attorneys the claims, specifications, etc. I have had occasion to examine hundreds of patents with a view of purchasing the same to manufacture in our business. I have been consulted many and many times as to the scope and bearing of patents on various mechanical devices. I have had the entire charge of several patent suits in which the company I was associated with was engaged. It had been my duty to prepare the models, samples, copies of patents, examine the same and arrange them so they might be used in evidence. In this way I have had considerable experience in examining patents, and in connection with patented machinery generally. I have several times visited Washington, spent a week or two each time looking over, examining and comparing patents and models in certain classes of inventions found there.

Q. 7. You may state, if you can, how the refrigerators which have been manufactured and placed on the market during the last ten or eleven years compare with each other, so far as their general form, size and general appearance are concerned.

A. All the different refrigerators in the market, so far as I know, possess features peculiarly similar or alike, as much so as are wagons, articles of furniture, chairs and various other articles in common use.

Q. 8. You may state whether or not the ordinary household refrigerators which have been manufactured by different companies during the last ten years say, differ strikingly in outward appearances.

A. As far as my knowledge extends, there is but a slight difference in appearance. I would refer to the refrigerators of John C. Jewitt, manufactured at Buffalo, N. Y., the Belding M'f'g Co. refrigerators, manufactured at Belding, Mich.; to the Wayne refrigerator, manufactured at Cincinnati, O.; to the Baldwin refrigerator, manufactured at Burlington, Vt.; to the Iceberg Chief, man-

511 ufactured at Sheboygan, Wis.; the Alaska refrigerator, manufactured at Michigan City; the Leonard refrigerator, manufactured at Grand Rapids, Mich. These refrigerators are all similar in appearance, the only difference being in the panel-work and in brackets used on various parts of the cases as ornamentations, carving on the panels, some different curve or form to the feet, a little difference in the shape of the mouldings, and the coloring of the same. The refrigerator the easiest to distinguish from the rest is the New Perfection refrigerator, manufactured at Belding, Mich., as it has been manufactured for the past few years. Its striking features to distinguish it from the other refrigerators enumerated have been the cherry mouldings placed around it at the top and base. These have been of quite a bright red and in addition thereto there has always been a bracket placed at the top next the

lid moulding. This bracket has also been made of cherry and stained a bright red. The rest of the refrigerator, until lately, has been the natural color of the wood without staining. This contrast would readily enable any person familiar with these different refrigerators to distinguish them from other manufactures. Otherwise there is practically no difference.

Q. 9. You may state whether or not your company in manufacturing refrigerators have copied or imitated intentionally or otherwise the complainant's refrigerator.

A. We have not; on the contrary, for the reasons stated in the last answer, it more nearly resembles some of the other refrigerators enumerated than it does the Belding refrigerator.

Q. 10. How has it been as to the coloring or staining of the wood? I refer to what is usually called antique color.

A. It has been our custom to finish a portion of our refrigerators in the plain white natural wood without any stain or coloring. A portion of them have been finished with the panels antique or colored, and a portion of them, in fact all refrigerators we have
512 made in the last two years, have been stained and finished antique, that is to say, the whole refrigerator was finished in one color, which is termed antique.

Q. 11. State whether or not the complainants have adopted the antique coloring since it was adopted by the Challenge Corn Planter Co.

A. I do not know that the complainants have now adopted the antique. Their goods which I saw in market last year were all finished in the white with the cherry mouldings as stated. Such goods are now in market at Foster, Stevens & Co.'s hardware store, and were in market in a store on Canal St., the name of which I do not know, last season. I am of the opinion that they made a portion of their goods and finished them in antique last season. Mr. Smith of the Simmons Hardware Co. of St. Louis, Mo., informed me that the goods manufactured for them last season by the Belding M'f'g Co. were finished in antique.

Q. 12. You may state if you know how early the Leonard refrigerator was introduced and put upon the market. I refer to the Leonard refrigerator, manufactured at Grand Rapids, Michigan.

A. I have no means of knowing when the Leonard refrigerator was first placed on the market. It was on the market before we commenced to manufacture refrigerators and was thoroughly examined by me before we commenced to manufacture refrigerators. It was on the market in the year 1885.

Q. 13. State whether the defendants ever used any cherry moulding upon its refrigerators.

A. We never at any time used any cherry moulding on our refrigerators. Neither have we used any brackets as is used on the Belding refrigerator.

Q. 14. You may state how the bottom of the ice-box is put in in defendant's refrigerator.

A. The front and back walls of the lining of the refrigerator is

grooved so as to admit the bottom boards to be inserted in
513 said groove in order to hold them substantial and permanent. The groove in the back of the refrigerator is half an inch lower than on the front. This construction makes the back side of the bottom half an inch lower than the front. These grooves are single grooves across the front and back of the refrigerator.

Q. 15. State whether or not the partition between the provision chambers extends into the ice-chamber.

A. It does not. It extends up to within about a half an inch, more or less, of the bottom of the floor of the ice-chamber.

Q. 16. State whether or not any water from the melting ice in the defendant's refrigerator can pass through the ice-table upon the zinc strip.

A. The ice-rack being made of a solid piece of corrugated galvanized iron, it would be impossible for water to pass through it unless it had apertures or holes through it which it does not have.

Q. 17. Can you produce the catalogues for the year 1886 of the various companies or individuals whose refrigerators you say show that there is considerable similarity in outward appearance of ordinary household refrigerators? If so, produce them.

A. I can and do. The catalogue of the Iceberg Chief does not show in what year it was issued, but I obtained it that season, in the spring of 1886. I would say in relation to the Baldwin refrigerator that so far as this catalogue is concerned it does not show that it was an 1886 catalogue, but it was issued in the spring of 1886 and I obtained it then.

The catalogues referred to are offered and received in evidence, and are marked respectively "Defendant's Exhibit" before the name of each catalogue.

Counsel for complainant objects to the same as incompetent, irrelevant and immaterial.

The list above referred to is as follows:

Leonard catalogue.
Alaska catalogue.
514 Baldwin catalogue.
Iceberg Chief catalogue.
Joseph W. Wayne catalogue.
John C. Jewett catalogue.

Counsel for the Challenge Corn Planter Co. offers in evidence the letters heretofore filed and now in the clerk's office of the U. S. circuit court for the western district of Michigan, southern division, said letters having been heretofore used on a motion in this cause; and also offers in evidence a letter bearing date March 15, 1889, purporting to have been written by the treasurer of the Belding Co., and the same is received and marked "Defendant's Exhibit Belding Co. Letter of March 15, 1889, to Foster, Stevens & Co."

Also letter dated Feb. 29, 1889, purporting to have been written by the Francis C. Witte Hardware Co. to the Challenge Refrigerator Co., and the same is received and marked "Defendant's Exhibit Francis T. Witte Hardware Co. Letter."

Also a letter dated March 9, 1889, from the Francis T. Witte Hardware Co. to the Challenge Corn Planter Co., and the same is received and marked "Defendant's Exhibit Francis T. Witte Hardware Co. Letter No. 2."

Counsel for Belding M'f'g Co. here objects to each and every of the said letter exhibits as incompetent, irrelevant and immaterial.

Cross-examination by Mr. BROWN:

C. Q. 1. Under what patent or patents is or has your company been manufacturing its refrigerators?

A. We have not manufactured refrigerators under any patent, except the patents on the casters and floor plates that we attached to our refrigerators.

C. Q. 2. These patents have nothing to do with the interior construction, have they?

A. No, sir.

C. Q. 3. Give the date when the Challenge Corn Planter
514½ Co. began to manufacture refrigerators, and also the date when it first put its refrigerators on the market?

A. They commenced the manufacture of refrigerators in the fall of 1885, and placed our first refrigerators on the market in the spring of 1886.

C. Q. 5. Can you give the date more accurately than you have done, when your company first began the manufacture of refrigerators?

A I cannot at present.

C. Q. 6. Can you fix this date with reference to the date Nov. 11, 1885, when you say you visited Belding?

A. It was about the time, perhaps we had commenced getting out some material before my visit to Belding. I am unable to fix any positive dates.

C. Q. 7. You are not positive, then, whether it was before or after your visit to Belding on the 11th of November that your company commenced the manufacture of refrigerators?

A. My impression at present is that we did not cut a piece of timber for a refrigerator before the first day of December. Possibly not till near the last of December, 1885.

C. Q. 8. Before beginning the manufacture of refrigerators what preparation therefor was made by your company in the way of purchasing or arranging machinery, arranging room or rooms for the manufacture of refrigerators, purchasing tools or materials, and the hiring of workmen and the like?

A. When the Challenge Co. built their shops they were built much larger than required for their present business for the purpose of taking on some additional article of manufacture. They also had a large amount of wood-working machinery placed in the shops, and therefore had room and machinery sufficient so far as wood-working machinery was concerned, and room for painting and finishing goods, so that it required no provision in that direction to

take up the line of refrigerators and add to our manufacture.
514½ We also had in stock and at our disposal a sufficient amount of lumber to enable us to commence the manufacture. We already had workmen in our employ to do all the work required in manufacturing refrigerators, except that of tinning, consequently we made no arrangements in that line whatever till some time after we commenced on the wood-work. We afterwards (the date I cannot give) contracted with Mr. Lovell, of Ionia, to take charge of the tinning department.

C. Q. 9. Have you any memorandum here present by referring to which you would be enabled to more accurately state the date when your company began to manufacture refrigerators?

A. I have not, and it would be extremely difficult even if I had the books of the company before me, to place the exact date when the company first commenced to manufacture refrigerators, for this reason: We had but one or two men at first working at them, and then but a portion of the time. We made very few refrigerators for the spring trade of 1886, and they were produced or got ready for market very late in the season, there being but very little system in starting this manufacture, so far as regards keeping memorandum of the time, dates, etc., it would be impossible for me to place any definite date.

C. Q. 10. Give the names of the workmen employed in producing the refrigerators which were placed on the market in the spring of 1886. That is, the first lot of refrigerators manufactured by your company.

A. J. M. Lockie, J. C. Surprise, are the only names that I can now recall in the cabinet department that assisted in producing these goods.

C. Q. 11. Other than Mr. Lovell, whom did you have working on the tin-work?

A. I cannot recall the name of any individual in the tin shop. In fact Mr. Lovell, with the assistance of a boy or two, did most of the work. There was a transient man whose name I cannot recall worked for Mr. Lovell in the tinning department three or four weeks.

515 C. Q. 12. Are either Mr. Lovell, Lockie, or Surprise still working for your company?

A. Mr. Lockie and Mr. Surprise are still in our employ. Mr. Lovell is in the employ of Foster, Stevens & Co. of this city.

C. Q. 13. What was the finish of the exterior of this first lot of refrigerators?

A. I think the first lot of refrigerators were finished in plain white, or the natural grain of the wood without being stained.

C. Q. 14. When did you change to the antique finish?

A. A few of our first season's manufacture were finished in antique; a few were finished in plain white as indicated; and a few were finished with antique panels. The second season we run considerably on antique, and the next season I think we made nothing but antique.

C. Q. 15. Name some of the persons to whom your company sold

refrigerators manufactured for the season of 1886 with an antique finish.

A. It would be impossible for me to do so, as I have no memorandum of any description which I could refer to.

C. Q. 16. And without such memorandum you have no idea where those refrigerators were sold?

A. I have not.

(Adjourned to 2 p. m.

2 P. M.

(Met pursuant to adjournment.)

C. Q. 17. Name, if you can, some of the persons to whom your company sold refrigerators having an antique finish that were manufactured for the trade of 1887?

A. I could not name any customer of ours in 1887 to whom we sold the refrigerator with an antique finish.

C. Q. 18. When did you first know that the Belding M'f'g Co. was putting an antique finish upon its refrigerators?

A. I am unable to place any date. But the first that I have any recollection of was on the refrigerator at the Simmons Hardware
516 Co., St. Louis, which was said to have been manufactured by the Belding M'f'g Co. Last spring I saw through the windows at Hibbard & Spencer's hardware store, in Chicago, what I supposed to be Belding refrigerators that were finished in antique. I did not go in to examine them, but have every reason to believe they were Belding goods, and were the first goods that I have any recollection of seeing that were finished in antique and manufactured by the Belding Co.

C. Q. 19. Prior to the date when your company made refrigerators with an antique finish was there any other refrigerator on the market that you know of having an antique finish?

A. I cannot now say positively whether I had ever seen a refrigerator with full antique finish or not before we commenced the manufacture of refrigerators. My impression is that I had seen the Alaska refrigerator so finished.

C. Q. 20. In your answer to question five (5) have you given all the steps taken by your company or by others acting under the direction of your company in looking up and examining into refrigerator business prior to commencement of manufacture?

A. In addition to what I stated in answer to question five I would state that I obtained a Fisher refrigerator, and an Alaska refrigerator, a Leonard refrigerator, and some others that I do not recollect, brought them to the shop in order to ascertain their construction and see what points might be patented on them, and be thus enabled to avoid copying after these designs as much as possible, and to avoid infringing any patents under which these refrigerators might be manufactured. I looked up the patents of the several refrigerators that had patent marks on them fully. I went to Washington and spent a number of days in examining the file-wrappers of each of the patents and the models. Among others I examined the file-wrapper of the Smith refrigerator, known as the Alaska, also patent

of Mr. Leonard, also the Lovell Bros.'s patents. I do not
517 now recall any other action that was taken in that direction.

C. Q. 21. At the time of your visit to Washington, just referred to, did you make any examination of the state of the art of refrigerators and of the copies of patents found in the files in the Patent Office exemplifying the same?

A. I did; that was my business there.

C. Q. 22. Did you at that time so examine the Hambrook patent No. 204,216, here sued upon?

A. I did.

C. Q. 23. Did your company have an examination made of or a report on the state of the art of refrigerators by any attorney or attorneys or other persons than yourself?

A. Not to my knowledge.

C. Q. 24. Have you stated all of the conversation which took place between yourself and Mr. F. E. Ranney at the time of your visit to Belding in the month of August, 1885?

A. I have not. I was there some hours. We conversed about various things which I could not now recollect or repeat, but the substance of our conversation I think I have given before, so far as relates to refrigerators.

C. Q. 25. In what part of the shop did the conversation which you have related take place, and if there were others present besides yourself and Mr. Ranney state who they were, if you know?

A. To the best of my recollection Mr. Ranney and myself made a tour of the different departments, going from one room to another, this conversation taking place during our travels, stopping in some parts of the building to examine the work, sometimes to examine a machine. The conversation in regard to patent matter took place in what I suppose they would term the packing-room. It was there that I called his attention to the absence of a patent mark. I think
it was in that room that Mr. A. W. Ranney came along, and
518 Mr. Fred. Ranney left us together and I went with Mr. A. W. Ranney. He was introduced to me as a foreman. With the exception of the few moments' time that Mr. A. W. Ranney was present with Mr. Fred. Ranney and myself I have no recollection of any other party taking or holding conversation with us.

C. Q. 26. Did you at that time make any memorandum regarding the manufacture of refrigerators by the Belding Co., such, for example, as the number of machines used in the different kinds of work, the number of men employed, etc., etc.?

A. I did not.

C. Q. 27. Did you make any such memorandum at the time of your second visit to the Belding Co., Nov. 11, 1885?

A. I did not.

C. Q. 28. For what purpose did you purchase the Belding refrigerator on Nov. 11, 1885?

A. I purchased it for the purpose of making a thorough examination as to its construction, as to whether it might be manufactured under any patent.

C. Q. 29. What became of that refrigerator?

A. I do not know.

C. Q. 30. Was it ever taken apart in whole or part by yourself or any other person connected with your company?

A. I presume this refrigerator, also the Alaska refrigerator, also the Leonard refrigerator, and the Fisher refrigerator, and any others we might have had, were partially taken to pieces. They were most of them, after being partially taken to pieces, perhaps all of them, I could not say positively as to that, fixed up again and sold. They all, so far as I know, were treated alike.

C. Q. 31. Were any measurements taken from this Belding refrigerator?

A. I think there were.

C. Q. 32. When your company first began to manufacture refrigerators who laid out the work for the men?

519 A. The work was directed by myself.

C. Q. 33. What guide or guides did these different workmen have, such as cutting bills, templates, patterns, or the like, by which to perform the part of the work assigned to them?

A. The foreman had a cutting bill or table prepared with the size and dimensions of each piece entering into the construction for each size or style of refrigerator made.

C. Q. 34. Who was the foreman at this time?

A. Mr. J. M. Lockie.

C. Q. 35. Are those original cutting bills or tables in the possession of your company now?

A. They may be, some of them; there may not be any of them. The cutting bills are usually made, pasted or glued onto a board, and in use don't last a great while. These frequent changes of the size of a style which necessitates making a new cutting bill, though the change may not be but half an inch. For that reason I think it is very doubtful if there are any of the first cutting bills in existence.

C. Q. 36. Will you make an examination to ascertain whether or not any of such original cutting bills are still preserved, and if you find any of them will you produce the same and attach to your deposition?

A. I have no objection to doing so.

C. Q. 37. Who prepared those original cutting bills for the use of the foreman?

A. Mr. Lockie has, I believe, prepared all the cutting bills since we have commenced the manufacture of refrigerators.

C. Q. 38. Did he prepare the first one?

A. He did.

C. Q. 39. How long had Mr. Lockie been in the employ of your company at that time? That is Nov. or Dec., 1885.

A. I could not tell.

C. Q. 40. State approximately.

A. I could not place any date. He had probably been for a year or more in the employ of the company.

520 C. Q. 41. What had been his duties prior to the time when your company began the manufacture of refrigerators?

A. That of general foreman in the shop.

C. Q. 42. What had been his business prior to entering the employment of your company, if you know?

A. Immediately previous to entering our employ he had been foreman for the Stearns M'f'g Co. Prior to that he had been foreman for ten or twelve years for the Wait M'f'g Co. of Grand Haven, it being the company that the Challenge Corn Planter Co. were successors to.

C. Q. 43. Do you know from what source Foreman Lockie gained his information from which to prepare those original cutting bills?

A. Mr. Lockie prepared those cutting bills from my instructions, which were to this effect, to prepare a list of cutting bills for manufacturing the various family sizes of refrigerators, selecting such sizes as he thought were best adapted for family use, being referred to the various refrigerators we had in the shops from which to prepare the sizes.

C. Q. 44. Do you know whether or not he did actually refer to the refrigerators you have mentioned in preparing the sizes for his cutting bills according to your directions?

A. Personally, no, I do not know.

C. Q. 45. Have you any reason to believe that he did not carry out your instructions in this particular?

A. I do not know that I have. The particular sizes that I at the time favored when giving him the instructions were shown more nearly in the Fisher manufacture, perhaps, than any other, however, the catalogues and sizes of the different manufacturers being so very nearly alike that his instructions were to use his own discretion in relation to the specific size of any of the refrigerators.

C. Q. 46. Are you now willing to swear that the sizes of refrigerators on that original cutting bill were not more nearly like the Belding refrigerators than the other refrigerators then present?

521 A. I would not be willing to swear that it was or was not more nearly like one refrigerator than another.

C. Q. 47. In the conversation with Mr. F. E. Ranney, in August of 1885, did he tell you that he had been manufacturing the Booth & Osgood refrigerators, and prior to that time the Hambrook?

A. I think Mr. Ranney used the word we. I understood from that at the time that the Belding M'f'g Co. was the successor of both the Booth & Osgood and the Hambrook Cos.

C. Q. 48. Were you ever the mayor of Grand Haven, Mich.?

A. I was elected mayor of the city of Grand Haven at the spring election in 1885. I held the office for the term of one year.

C. Q. 49. On the occasion of the second visit to Belding, in November, 1885, of whom did you purchase the refrigerator?

A. Mr. Lewis, I think. There were two parties I talked with about the refrigerator. I paid the money, I think, to a young man by the name of Hall, but I suppose the purchase was made of Mr. Lewis.

C. Q. 50. If you had any conversation at that time with Mr. Lewis, or other person connected with the Belding M'f'g Co., state fully the conversation and with whom it was held?

A. I had quite a conversation with Mr. Lewis about various topics, the subject of refrigerators was talked of but little. I remained in the office a share of the time and went through the shops, and had but little conversation that could affect this case.

C. Q. 51. At what place in Ionia, Mich., did you in June, 1886, examine the New Perfection refrigerator?

A. Not being familiar with the streets and locations I could not name the place, but it was on a corner and a portion of the room was occupied for the sale and display of sewing machines.

522 I do not know the man's name, but am inclined to think it was a young man by the name of Hall sent there from the factory. I am not absolutely positive that this was in June, but it was in the early summer or late spring, when they were selling refrigerators.

C. Q. 52. Has your company made any change in the interior arrangement of its refrigerators from those manufactured for the spring of 1886 trade?

A. We have made no changes in the interior construction whatever. We have since added some different styles of construction to our list.

C. Q. 53. You manufacture, do you not, refrigerators having a single as well as a double provision chamber, such as are seen in the two exhibits Complainant's Exhibits Defendant's Refrigerators Nos. 1 and 2?

A. We do.

C. Q. 54. Give the date when your company first became aware of the fact that the Belding M'f'g Co. claimed that the refrigerators manufactured by it were manufactured under the Hambrook patent.

A. The first intimation we had was by letter from the Belding M'f'g Co.'s attorneys, Poole & Brown, of Chicago, notifying us of the same, the date of which letter I am unable to give, but think it was some time in February last. But as the letter is on file it will show for itself.

C. Q. 55. What refrigerator manufactured by your company corresponds with the number 3 refrigerator of the Belding M'f'g Co.?

A. Style C, No. 9, I think comes the nearest.

Counsel for the Challenge Corn Planter Co. objects to all questions on cross-examination referring to the size and form of the refrigerators and to all answers to such questions as irrelevant and immaterial, for the reason that such testimony is not pertinent to the issue in this case.

Counsel for Belding M'f'g Co. directs the attention of the court to the bill of complaint in this case, and to the answer thereto,

523 in which bill it is charged substantially that the Challenge Corn Planter Co. have manufactured refrigerators in such an exact imitation and copy both in exterior construction and ornamentation, as well as interior arrangement, as to deceive the public and purchasers of such goods, and that the answer denying such charge forms an issue in this case thereon, under which issue the said questions above objected to were put.

Redirect examination:

Q. 1. You may state whether or not there were any refrigerators in the Belding Co.'s factory, so far as you could see, bearing any patent mark when you visited the factory in November, 1885, and you may also state whether or not the refrigerator purchased by you at that time contained any patent mark.

A. I saw no refrigerators in the factory at Belding containing any patent mark of any description. The refrigerator which I purchased had no patent mark whatever.

Recross-examination:

C. Q. 1. Where were the refrigerators which you examined in November, 1885, and how many of them, and in what manner did you so examine them?

A. The refrigerators were in what I supposed to be the crating-room or packing-room. Some were crated; some were not. I examined them on the back where the stenciling was, and on other parts of the refrigerator, but more especially on the backs. The number that I saw I could not tell. It might have been fifteen, twenty or thirty.

LEVI SCOFIELD.

It is stipulated by and between the solicitors for the Belding M'f'g. Co. and the solicitors for the Challenge Corn Planter Co. that all proceedings and testimony relating to the cross-bill and pleadings thereunder be stayed until after the hearing on the original bill in the United States circuit court, and may be resumed after
524 such hearing upon due notice to the opposing party by either one of said parties.

Counsel for the Challenge Corn Planter Co. states that so far as anything known at present the defence to the original bill is closed, and it is mutually agreed between the counsel for both parties that the complainant in the original bill have to and including the 15th day of February next in which to close its rebutting proof.

525 Form No. 1.

The Western Union Telegraph Company.

This company transmits and delivers messages only on conditions limiting its liability, which have been assented to by the sender of the following message.

Errors can be guarded against only by repeating a message back to the sending station for comparison, and the company will not hold itself liable for errors or delays in transmission or delivery of unrepeated messages beyond the amount of tolls paid thereon nor in any case where the claim is not presented in writing within sixty days after sending the message.

This is an unrepeated message and is delivered by request of the sender, under the conditions named above.

NORVIN GREEN, *President.*

THOS. T. ECKERT,
General Manager.

[Written across the face:] 1058. 310. Ans. B.

Number	Sent by—	Rec'd by—	Check.
B. 116 C.	O.	C. C.	14, p'd.

5, 3, 1889.

Received at cor. La Salle and Washington streets, Chicago, Ills., 10.45 p. m., standard time.

Dated Cincinnati, O., 3.

To Pool & Brown, 225 Dearborn St.:

Mrs. Stem very ill; must beg short postponement of testimony; won't you accom-odate me?

ARTHUR STEM.

526 [Endorsed:] U. S. circuit court, western district of Michigan, southern division. Belding Manufacturing Co. *vs.* Challenge Corn Planter Co. In equity. No. 963. Complainant's Exhibit Stem Telegram No. 1. Marie L. Price, N. P. No. 963. Filed May 13, 1890. C. L. Fitch, clerk.

527 Form No. 1.

The Western Union Telegraph Company.

This company transmits and delivers messages only on conditions limiting its liability, which have been assented to by the sender of the following message.

Errors can be guarded against only by repeating a message back to the sending station for comparison, and the company will not hold itself liable for errors or delays in transmission or delivery of unrepeated messages beyond the amount of tolls paid thereon nor in any case where the claim is not presented in writing within sixty days after sending the message.

This is an unrepeated message and is delivered by request of the sender, under the conditions named above.

NORVIN GREEN, *President.*

THOS. T. ECKERT,
General Manager.

[Written across the face:] 1243, P. 1586. Ans. B.

Number.	Sent by—	Rec'd by—	Check.
A. B. 1 C.	H.	Qld.	16, p'd.

5, 6, 1889.

Received at cor. La Salle & Washington streets, Chicago, Ills., 12.36 p. m., standard time.

Dated Cincinnati, O., 6.

To Poole & Brown, 225 Dearborn St.:

Impossible for me to attend at Chicago on Wednesday. The suit entirely in my charge. Answer.

ARTHUR STEIN.

528 [Endorsed:] U. S. circuit court, western district of Michigan, southern division. Belding Manufacturing Co. *vs.* Challenge Corn Planter Co. In equity. No. 963. Complainant's Exhibit Stem Telegram No. 2. Marie L. Price, N. P. No. 963. Filed May 13, 1890. C. L. Fitch, clerk. 1255.

529 Form No. 44.

Night Message.

The Western Union Telegraph Company.

This company transmits and delivers messages only on conditions limiting its liability, which have been assented to by the sender of the following message.

Errors can be guarded against only by repeating a message back to the sending station for comparison, and the company will not hold itself liable for errors or delays in transmission or delivery of unrepeated night messages sent at reduced rates beyond a sum equal to ten times the amount paid for transmission nor in any case when the claim is not presented in writing within thirty days after sending the message.

This is an unrepeated night message and is delivered by request of the sender, under the conditions named above.

NORVIN GREEN, *President.*

THOS. T. ECKERT,
General Manager.

[Written across the face:] 1042, P.

Number.	Sent by—	Rec'd by—	Check.
B. 424 C.	Q.	A. B.	2 p'd, nite.

5, 6, 1889.

Received at cor. La Salle and Washington streets, Chicago, Ills., 10.40 p. m., standard time.

Dated Cincinnati, O., 6. 2786.

To Poole and Brown, No. 225 Dearborn, Chi.:

All right.

ARTHUR STEIN.

Received May 7, 1889. Answered by —— ——.

530 [Endorsed:] U. S. circuit court, western district of Michigan, southern division. Belding Manufacturing Co. *vs.* Challenge Corn Planter Co. In equity. No. 963. Complainant's Exhibit Stem Telegram No. 3. Marie L. Price, N. P. No. 963. Filed May 13, 1890. C. L. Fitch, clerk.

531 (2–175.)

DEPARTMENT OF THE INTERIOR.

[Vignette.]

UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted Richard T. Hambrook May 28, 1878, number 204,216, for improvement in refrigerators.

In testimony whereof I, C. E. Mitchell, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 9th day of April, in the year of our Lord one thousand eight hundred and eighty-nine, and of the Independence of the United States the one hundred and thirteenth.

Seal Patent Office, United States of America.

C. E. MITCHELL,
Commissioner.

532 [Endorsed:] United States circuit court, western district of Michigan, southern div'n. Belding Manufacturing Co. *vs.* Challenge Corn Planter Co. In equity. No. 963. "Complainant's Exhibit Hambrook Patent." Marie L. Price, notary public. No. 963. Filed May 13, 1890. C. L. Fitch, clerk.

533 (2–155.)

No. 204,216.

THE UNITED STATES OF AMERICA.

[Vignette.]

To all to whom these presents shall come:

Whereas Richard T. Hambrook, of Chicago, Illinois, has presented to the Commissioner of Patents a petition praying for the grant of letters patent for an alleged new and useful improvement in refrigerators, a description of which invention is contained in the specification, of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of law in such case made and provided; and

Whereas, upon due examination made, the said claimant is adjudged to be justly entitled to a patent under the law:

Now, therefore, these letters patent are to grant unto the said

Richard T. Hambrook, his heirs or assigns, for the term of seventeen years from the twenty-eighth day of May, one thousand eight hundred and seventy-eight, the exclusive right to make, use, and vend the said invention throughout the United States and the territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the city of Washington, this twenty-eighth day of May, in the year of our Lord one thousand eight hundred and seventy-eight, and of the Independence of the United States of America the one hundred and second.

Seal Patent Office, United States of America.

A. BELL,
Acting Secretary of the Interior.

Countersigned:
W. H. DOOLITTLE,
Acting Commissioner of Patents.

No. 235
Belden Mfg Co
+
Challenge Corn
Planter Co
} b. 234

R. T. HAMBROOK.
Refrigerators.

No. 204,216. Patented May 28, 1878.

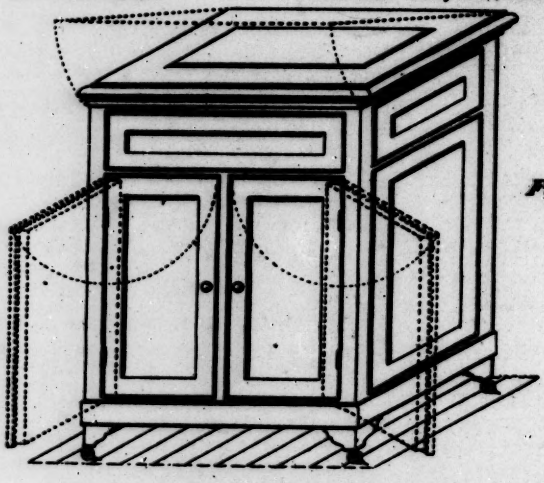

Fig. 1.

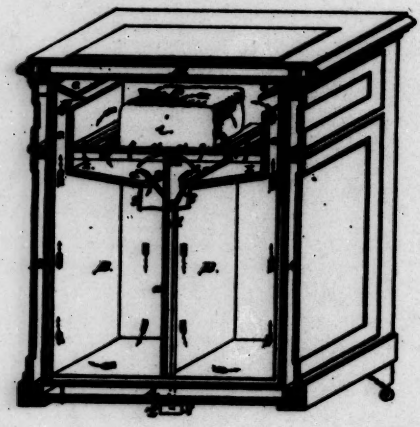

Fig. II.

Witnesses,
Jno Lewis
Henry C Whitney

Inventor,
Richard T. Hambrook

535 UNITED STATES PATENT OFFICE.

RICHARD T. HAMBROOK, of Chicago, Illinois.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 204,216, dated May 28, 1878; application filed March 2, 1878.

To all whom it may concern:

Be it known that I, Richard T. Hambrook, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in refrigerators; and do hereby declare the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction of a refrigerator having the ice-chamber constructed in such manner that the air will impinge upon the top, bottom, and sides of the ice, and that the continuous volume of cold air generated by the melting of the ice will descend, in a dry state, to the provision-chamber without material hindrance, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending current of cold air.

To enable others skilled in the art to which my invention appertains to construct and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

(Here follows diagram marked p. 534.)

Figure 1 is a perspective view of my invention, and Fig. 2 is a vertical section thereof.

A represents the outer box or cabinet of the refrigerator. B B represent the provision-chambers, each having a door opening from the center outward. The provision-chambers are separated from each other by the perpendicular partition *a*, which is composed of wood, sheet metal, or other suitable substance, and extends from front to rear of the provision-chamber, and from the bottom thereof into the ice-chamber, as hereinafter described.

The inner box of the refrigerator constitutes the sides and bottom of the provision-chambers, as well as the front and rear sides of the ice-chamber. It is lined with metal throughout its entire extent, and is securely fastend and retained in its relative position to the outer case or cabinet by any proper means used by makers of refrigerators, but in such manner as to leave a suitable space on all sides and at its bottom for the retention of fixed air as a non-conductor, or for the packing of charcoal, saw-dust, or other non-conducting substance to prevent the temperature of the external air from making an impression upon the temperature of the provision-

chambers. Said insulating-space is permanently closed at the top thereof in all its parts by close joinder with the outer box, in any proper manner.

D is the hinged lid, adjusted in the manner usual in refrigerators, and by means whereof access to the ice-chamber is attained.

c x and *c y* are side and bottom pieces, securely joined to the front and rear of the inner box, and together with such front and rear constituting the ice-chamber C. The entire four sides and bottom pieces aforesaid are lined with metal, the joints being likewise closely soldered together. The bottom pieces *x* and *y* incline sufficiently toward the center to readily carry off the drip from the ice, and the sheet metal which lines said bottom pieces is sufficiently extended at the lower or depressed edges of said bottom boards as to be formed into respective gutters *z z*, which are connected by any suitable means with a perpendicular waste-pipe, z^1, located in the front or rear of the refrigerator, as may be preferred, extending beneath the same, and the mouth thereof being provided with a trap, z^2, siphon, or other means, to allow the escape of water without admitting the external air to the interior of the refrigerator. The two independent sides of the ice-chamber, which are annexed to the bottom pieces *x* and *y*, are located one or two inches (or more, if desirable) from the sides of the inner box of the refrigerator, so as to admit of a free circulation of air at the spaces *c c*. Between the provision-chamber and the ice-chamber a projection, *e e*, is placed just beneath the hinged lid and just above the space *c c* on each side of the ice-chamber, so as to effectually guard the falling of ice or other ponderable substances from the top into the provision-chamber through the aforesaid spaces.

The lower edges of the bottom boards *x* and *y* are equidistant from the perpendicular partition *a*, which extends into the ice-chamber a few inches above the gutters *z z*. Upon the top of said partition, extending longitudinally along the length thereof, is a narrow sheet of curved metal or other suitable substance, K, securely fastened, and so arranged as to allow the drip from the ice to fall from said strip of metal upon the bottom boards *x* and *y*, clear of the spaces *d d*.

536 The spaces *d d* between the partition *a* and the respective gutters *z z* are preferably about one and a half inch, but may be of any other width, and the spaces between the lower edges of the metallic strip K and the points on the respective bottom boards *x* and *y* immediately beneath should be of about the same width.

c' is a movable rack or open-work platform, to hold the ice, consisting of narrow strips of hard wood or other suitable substance, screwed or otherwise secured to transverse strips of wood or other suitable material, with open spaces between, so as to allow the air to reach the ice from all directions. Said rack may rest upon cleats in the sides of the ice-chamber, or other suitable mode for its location may be adopted.

If desirable, the ice-chamber may be divided into two parts by extending the partition *a* to the top of the ice-chamber and bisecting the curved apron K longitudinally, and affixing each half

thereof upon the respective sides of the partition *a* at the same relative position to the bottom pieces *x* and *y*, as shown in the drawing.

It is sometimes preferable, and I claim the right, to make a close-jointed and metallic-lined recess, *s s*, immediately under the edges of the bottom pieces *x y*, and extending a few inches into the interior from the front, into which recess the gutters *z z* can discharge the drip from the ice; and in such event the waste-pipe z^1 does not reach to the gutters *z z*, but is firmly and securely soldered to the bottom of the recess *s s*, so as to drain it of the water which is drained from the gutters *z z*. When thus arranged the metallic curved plate K is abridged so as to cover the recess *s s*.

When ice *i* is placed upon the rack *c'* in the ice-chamber C, the air which is in immediate contact therewith will settle toward the bottom of the ice-chamber C, and will thence pass through the openings *d d* and fall toward the bottom of the provision-chambers B B. The cold air thus falling will displace that of a less frigid temperature, which latter will rise and pass through the narrow spaces *c c*, and will impinge upon the ice *i*, which will absorb its moisture, and again be precipitated in a dry and frigid state into the provision-chambers, thus keeping the latter dry and thoroughly ventilated. The drip from the ice, after falling on the curved strip K and the bottom pieces *x* and *y*, is caught in the gutters *z z*, whence it is carried off by the waste-pipe z^1.

I do not claim an outside box and inside provision-chamber or their combination; neither do I claim the fixed air-space between the two, or other method of insulation; neither do I claim the principle of ventilating the provision-chambers by means of a descending current of cold air displacing and causing to ascend the less frigid air; nor do I claim the partitioning of the provision-chamber into two compartments; nor yet do I claim the affixing the trap or siphon to the waste-pipe.

Having thus fully described my invention, and disclaimed so far as seems needful, what I claim as new, and desire to secure by letters patent, is—

In combination with the provision-chambers B B, the ice-chamber C, having rack *c'* and double-inclined bottom pieces *x* and *y*, provided with a central opening guarded by the deflector plate K, and provided, also, with the side passage *c* from the provision-chamber and the trough *z*, and pipe *z*, all substantially as described and shown, for the purpose set forth.

RICHARD T. HAMBROOK.

Witnesses:
JNO. LEWIS.
H. C. WHITNEY.

537 DEFENDANT'S EXHIBIT HAMBROOK FILE-WRAPPER. Hugh E. Wilson, Notary Public, Kent County, Mich.

Filed May 28, 1890. C. L. Fitch, clerk.

(2–175.)

DEPARTMENT OF THE INTERIOR.

[Vignette.]

UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the files of this office of the file-wrapper and contents in the matter of the letters patent granted Richard T. Hambrook May 28th, 1878, number 204,216, for improvement in refrigerators.

Seal Patent Office, United States of America.

In testimony whereof I, Benton J. Hall, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 19th day of March, in the year of our Lord one thousand eight hundred and eighty-nine, and of the Independence of the United States the one hundred and thirteenth.

BENTON J. HALL,
Commissioner.

538 CHICAGO, *Feb'y 27th*, 1878.

The Commissioner of Patents.

SIR: I have the honor to forward petition, specification, drawing, and model for patent for improvement in refrigerators for Mr. Richard T. Hambrook, of this city, which I will thank you to consider and confer with me about.

Respectfully, your ob't servant, H. C. WHITNEY.

[Endorsed:] 26863. U. S. A. Patent Office, Mar. 2, 1878.

539 To the Commissioner of Patents:

Your petitioner, a resident of the city of Chicago, State of Illinois, prays that letters patent may be granted to him for the invention set forth in the annexed specification; and he hereby appoints Henry C. Whitney, of the city of Chicago and State of Illinois, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

RICHARD T. HAMBROOK.

[Endorsed:] U. S. A. Patent Office, Mar. 2, 1878.

540 Model, 1 dr.; $15, c'k.

To all whom it may concern:

Be it known that I, Richard T. Hambrook, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in refrigerators, and do hereby declare the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the
Erase per "A." construction [and arrangement]* of a refrigerator having the ice-chamber constructed in such manner that the air will impinge upon the top, bottom, and sides of the ice, and that the continuous volume of cold air generated by the melting of the ice will descend in a dry state to the provision chamber without material hindrance, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending current of cold air.

To enable others skilled in the art to which my invention appertains to construct and use the same I will now proceed to describe its construction and operation, referring to the annexed drawings, in which figure 1 is a perspective view of my invention and figure 2 is a vertical section thereof.

A represents the outer box or cabinet of the refrigerator; B B represent the provision chambers, each having a door opening from the center outwards. The provision chambers are separated from each other by the perpendicular partition *a*, which is com-
541 posed of wood, sheet metal, or other suitable substance, and extends from front to rear of the provision chamber and from the bottom thereof into the ice-chamber, as hereinafter described. The inner box of the refrigerator constitutes the sides and bottom of the provision chambers as well as the front and rear sides of the ice-chamber. It is lined with metal throughout its entire extent and is securely fastened and retained in its relative position to the outer case or cabinet by any proper means used by makers of refrigerators, but in such manner as to leave a suitable space on all sides and at its bottom for the retention of fixed air as a non-conductor, or for the packing of charcoal, sawdust, or other non-conducting substance to prevent the temperature of the external air from making an impression upon the temperature of the provision chambers. Said insulating space is permanently closed at the top thereof in all its parts by close joinder with the outer box in any proper manner. D is a hinged lid, adjusted in the manner usual in refrigerators, and by means whereof access to the ice-chamber is attained.

c x and *c y* are side and bottom pieces securely joined to the front and rear of the inner box and together with such front and rear constituting the ice-chamber C; the entire four sides and bottom

*[Words in brackets erased in copy.]

pieces aforesaid are lined with metal, the joints being likewise closely soldered together. The bottom pieces *x* and *y* incline sufficiently toward the center to readily carry off the drip from the ice, and the sheet metal which lines said bottom pieces *are* sufficiently
542 extended at the lower or depressed edges of said bottom boards so as to be formed into respective gutters, *z z*, which are connected by any suitable means with a perpendicular waste pipe, z^1, located in the front or rear of the refrigerator (as may be preferred), extending beneath the same, and the mouth thereof being provided with a trap, z^2, siphon, or other means to allow the escape of water without admitting the external air to the interior of the refrigerator. The two independant sides of the ice-chamber, which are annexed to the bottom pieces *x* and *y*, are located one or two inches (or more if desirable) from the sides of the inner box of the refrigerator, so as to admit of a free circulation of air at the spaces, *c c*, between the provision chamber and the ice-chamber. A projection, *e e*, is placed just beneath the hinged lid and just above the space *c c* on each side of the ice-chamber, so as to effectually guard the falling of ice or other ponderable substances from the top into the provision chamber through the aforesaid spaces. The lower edges of the bottom boards, *x* and *y*, are equidistant from the perpendicular partition *a*, which extends into the ice-chamber a few inches above the gutters, *z z*, upon the top of said partition. Extending longitudinally along the length thereof is a narrow sheet of curved metal or other suitable substance, K, securely fastened and so arranged as to allow the drip from the ice to fall from said strip of metal upon the bottom boards *x* and *y* clear of the spaces *d d*. The spaces *d d* between the partition *a* and the respective gutters *z z* are preferably about one ½ inches, but may be of
543 any other width, and the spaces between the lower edges of the metallic strip K and the points on the respective bottom boards *x* and *y* immediately beneath should be of about the same width. c^1 is a movable rack or open-work platform to hold the ice, consisting of narrow strips of hard wood or other suitable substance screwed or otherwise secured to transverse strips of wood or other suitable material, with open spaces between, so as to allow the air to reach the ice from all directions. Said rack may rest upon cleats in the sides of the ice-chamber or other suitable mode for its location. If desirable the ice-chamber may be divided into two parts by extending the partition *a* to the top of the ice-chamber and bisecting the curved apron *k* longitudinally and affixing each half thereof upon the respective sides of the partition *a* at the same relative position to the bottom pieces *x* and *y* as shown in the drawing.

It is sometimes preferable, and I claim the right to make a close-jointed and metallic-lined recess, *s s*, immediately under the edges of the bottom pieces *x y* & extending a few inches into the interior from the front, into which recess the gutters *z z* can discharge the drip from the ice, and in such event the waste-pipe *z'* does not reach to the gutters *z z*, but is firmly and securely soldered to the bottom of the recess *s s*, so as to drain it of the water which is drained from

the gutters *z z*. When thus arranged the metallic curved plate K is abridged so as to to cover the recess *s s*.

When ice, *i*, is placed upon the rack c^1 in the ice-chamber C the air which is in immediate contact therewith will settle toward the bottom of the ice-chamber C and will thence pass through the openings *d d* and fall towards the bottom of the provision chambers B B. The cold air thus falling will displace that of a less frigid temperature, which latter will rise and pass through the narrow spaces *c c* and will impinge upon the ice *i*, which will absorb
544 its moisture and again be precipitated in a dry and frigid state into the provision chambers, thus keeping the latter dry and thoroughly ventilated. The drip from the ice, after falling on the curved strip *k* and the bottom pieces *x* and *y*, is caught in the gutters *z z*, whence it is carried off by the wash-pipe z^1.

I do not claim an outside box and inside provision chamber or their combination; neither do I claim the fixed air space between the two or other method of insulation; neither do I claim the principle of ventilating the provision chambers by means of a descending current of cold dry air displacing and causing to ascend the less frigid air; nor do I claim the partitioning of the provision chamber into two compartments; nor yet do I claim the affixing the trap or siphon to the waste pipe.

Having thus fully described my invention and disclaimed so far as seems needful, what I claim as new and desire to secure by letters patent is:

Erase and insert "A."

1. The combination of the open-work platform c^1 with the ice-chamber C for the purpose of holding the ice so that the air may circulate about it in all directions, substantially as described.

2. So combining the ice-chamber C with the rack c^1 for holding the ice with the provision chamber as that a con-
Act.* tinuous and unimpeded circulation of air may be maintained about all sides of the ice in the ice-cham-
545 ber, and also through the provision chamber, so that the dampness of the circulating air may be absorbed by the ice each time it impinges on it and be dried and refrigerated and permitted to fall by gravitation, substantially as described.

3. The mode described of ventilating the provision
Bad.* chambers B B in combination with the rack c^1 and the
?* inclined bottom pieces *x* and *y* and the gutters *z z* and the narrow spaces *c c* for the less frigid air to rise through without meeting and without its moisture being condensed by the descending volume of cold air, substantially as set forth.

RICHARD T. HAMBROOK.

Witnesses:
JNO. LEURS.
H. C. WHITNEY.

[Paragraphs enclosed between rules erased in copy.]
[* In pencil in copy.]

546 STATE OF ILLINOIS, } ss:
County of Cook, }

Richard T. Hambrook, the above-named petitioner, being duly sworn, deposes and says that he verily believes himself to be the original and first inventor of the improvement in refrigerators described and claimed in the foregoing specification; that he does not know and does not believe that the same was ever before known or used, and that he is a citizen of the United States and a resident of Chicago, Cook county, Illinois.

RICHARD T. HAMBROOK.

Sworn to & subscribed before me this 23d day of February, A. D. 1878.

H. C. WHITNEY,
[L. S.] *Notary Public, Cook Co., Ill.*

[Endorsed:] 2683. 1. Application. U. S. A., Patent Office, Mar. 2, 1878.

547 Room No. 151.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *M'ch 30th*, 1878.
C., *Apr.* 2, "

Richard T. Hambrook, care Henry C. Whitney, No. 50 Ashland block, Chicago, Ill.:

"Refrigerators." Filed M'ch 2d, '78. 26863.

The 1st & 2nd claims are anticipated by W. Bray, M'ch 4th, 1873, No. 136,484, and J. Turner, Dec. 28th, 1875, No. 171,491 (refrig. cars). The 2nd claim is also bad in form, being to an act. The 3rd also is informal, as it is to a combination of the process with the apparatus. It is, however, anticipated by A. J. Chase, Oct. 5th, 1869, No. 95428 (refrig's).

A rejection is declared.

R. G. DYRENFORTH, *Examiner.*
A. W. H.

[Endorsed:] 26863. 2. March 30, 1878. Rej.

548 CHICAGO, *May 1st*, 1878.

To the Commissioner of Patents:

I have the honor to forward an amendment to the specification and claim in the matter of the application of Richard T. Hambrook for letters patent for an improvements in refrigerators and ask for a reconsideration of the rejection heretofore declared in said application and an allowance of the patent by the claim as amended.

Very respectfully, your ob't servant,

HENRY C. WHITNEY, *Att'y.*

549 To the Commissioner of Patents:

In the matter of the application of Richard T. Hambrook for improvement in refrigerators, filed on or about March 2d, 1878, I beg to amend the specification by striking out the words "and arrangements" when they occur in line 12, page one (1); also by cancelling all of the present claims and substituting therefor the following, viz:

"A."* ✓ "In combination with the provision chambers B B the ice-chamber C, having rack c^1 and double-inclined bottom pieces X and Y, provided with a central opening guarded by the deflector plate K, and provided also with the side passage C from the provision chamber, and the trough z and pipe z^1, all substantially as described and shown for the purpose set forth."

Very respectfully, HENRY C. WHITNEY,
Attorney for Richard T. Hambrook.

[Endorsed:] 26863. 3. May 4, 1878. Am'd't "A." In the matter of application of Richard T. Hambrook for improvement in refrigerators. U. S. A., Patent Office, May 4, 1878.

550 $20 cert.

CHICAGO, *May 18th*, 1878.

The Commissioner of Patents, Washington, D. C.

SIR: I have the honor to forward herewith certificate of the U. S. depository, at Chicago, for twenty dollars, being final fee for letters patent as stated below:

Inventor: Richard T. Hambrook.
Invention: Improvement in refrigerator-.
Allowed: May 16, 1878.
No assignment. Letters patent to be issued to inventor.

Yours truly, RICHARD T. HAMBROOK,
By HENRY C. WHITNEY,
His Attorney, 50 Ashland Block.

[Endorsed:] U. S. A., Patent Office, May 23, 1878.

551 Dyrenforth.

✓ 1878. 26863.

✓

No. 204,216.

Richard T. Hambrook,

Of Chicago,
County of Cook,
State of Illinois.

Refrigerators.

Rec'd March 2, 1878.
Petition, " " "
Affidavit, " " "
Specification, " " "
Drawing, " " "
Model, " " "

1. Cert. dep., $15, March 2, 1878.
Cash, —.
Add'l fee cert., $20.00, May 23, 1878.
" " cash, —.
Examined May 14th, '78. R. G. Dyrenforth.
2. Issue, May 15, '78. F. A. Seely.
Patented May 28, 1878.
3. Circular, May 16, 1878.

HENRY C. WHITNEY,
50 Ashland Block, Chicago, Ills.

552 R. W. 1878.

Contents.

Application papers. K.
1. Application.
2. M'ch 30, '78, rej.
3. May 4, 1878, am'd't.
4.
5.
6.
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Title: Improvement in refrigerators. 17. 62 refrigeration refrigerators.
Ex'd: E. L. L.; E. C. C.

[Endorsed:] 4520. D. 1, '89.

No. 235.
Belden Mfg. Co.
Challenge
Com Planter 6
} p. 553

R. T. HAMBROOK.
Refrigerators.

No. 204,216. **Patented May 28, 1878.**

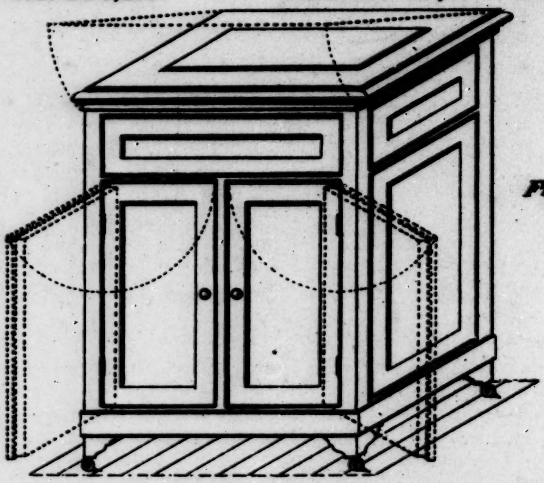

Fig. 1.

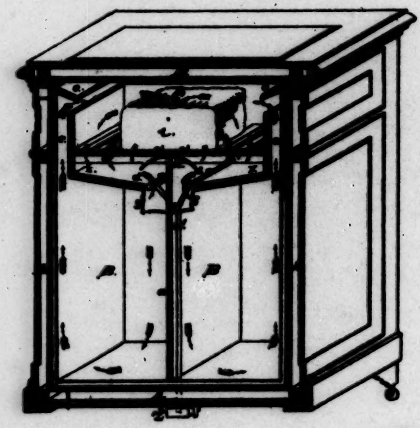

Fig. II.

Witnesses,
Jno Lewis
Henry C. Whitney

Inventor.
Richard T. Hambrook

554 UNITED STATES PATENT OFFICE.

RICHARD T. HAMBROOK, of Chicago, Illinois.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 204,216, dated May 28, 1878; application filed March 2, 1878.

To all whom it may concern:

Be it known that I, Richard T. Hambrook, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in refrigerators; and do hereby declare the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction of a refrigerator having the ice-chamber constructed in such manner that the air will impinge upon the top, bottom, and sides of the ice, and that the continuous volume of cold air generated by the melting of the ice will descend, in a dry state, to the provision-chamber without material hindrance, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending current of cold air.

To enable others skilled in the art to which my invention appertains to construct and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

(Here follows diagram marked p. 553.)

Figure 1 is a perspective view of my invention, and Fig. 2 is a vertical section thereof.

A represents the outer box or cabinet of the refrigerator. B B represent the provision-chambers, each having a door opening from the center outward. The provision-chambers are separated from each other by the perpendicular partition *a*, which is composed of wood, sheet metal, or other suitable substance, and extends from front to rear of the provision-chamber, and from the bottom thereof into the ice-chamber, as hereinafter described.

The inner box of the refrigerator constitutes the sides and bottom of the provision-chambers, as well as the front and rear sides of the ice-chamber. It is lined with metal throughout its entire extent, and is securely fastened and retained in its relative position to the outer case or cabinet by any proper means used by makers of refrigerators, but in such manner as to leave a suitable space on all sides and at its bottom for the retention of fixed air as a non-conductor, or for the packing of charcoal, sawdust, or other non-conducting substance to prevent the temperature of the external air from making an impression upon the temperature of the pro-

vision-chambers. Said insulating-space is permanently closed at the top thereof in all its parts by close joinder with the outer box, in any proper manner.

D is the hinged lid, adjusted in the manner used in refrigerators, and by means whereof access to the ice chamber is attained.

c x and *c y* are side and bottom pieces, securely joined to the front and rear of the inner box, and together with such front and rear constituting the ice-chamber C. The entire four sides and bottom pieces aforesaid are lined with metal, the joints being likewise closely soldered together. The bottom pieces *x* and *y* incline sufficiently toward the center to readily carry off the drip from the ice, and the sheet metal which lines said bottom pieces is sufficiently extended at the lower or depressed edges of said bottom boards as to be formed into respective gutters *z z*, which are connected by any suitable means with a perpendicular waste-pipe, z^1, located in the front or rear of the refrigerator, as may be preferred, extending beneath the same, and the mouth thereof being provided with a trap, z^2, siphon, or other means, to allow the escape of water without admitting the external air to the interior of the refrigerator. The two independent sides of the ice-chamber, which are annexed to the bottom pieces *x* and *y*, are located one or two inches (or more, if desirable) from the sides of the inner box of the refrigerator, so as to admit of a free circulation of air at the spaces *c c*. Between the provision-chamber and the ice-chamber a projection, *e e*, is placed just beneath the hinged lid and just above the space *c c* on each side of the ice-chamber, so as to effectually guard the falling of ice or other ponderable substances from the top into the provision-chamber through the aforesaid spaces.

The lower edges of the bottom boards *x* and *y* are equidistant from the perpendicular partition *a*, which extends into the ice-chamber a few inches above the gutters *z z*. Upon the top of said partition, extending longitudinally along the length thereof, is a narrow sheet of curved metal or other suitable substance, K, securely fastened, and so arranged as to allow the drip from the ice to fall from said strip of metal upon the bottom boards *x* and *y*, clear of the spaces *d d*.

555 The spaces *d d* between the partition *a* and the respective gutters *z z* are preferably about one and a half inch, but may be of any other width, and the spaces between the lower edges of the metallic strip K and the points on the respective bottom boards *x* and *y* immediately beneath should be of about the same width.

c' is a movable rack or open-work platform, to hold the ice, consisting of narrow strips of hard wood or other suitable substance, screwed or otherwise secured to transverse strips of wood or other suitable material, with open spaces between, so as to allow the air to reach the ice from all directions. Said rack may rest upon cleats in the sides of the ice-chamber, or other suitable mode for its location may be adopted.

If desirable, the ice-chamber may be divided into two parts by extending the partition *a* to the top of the ice-chamber and bisecting the curved apron K longitudinally, and affixing each half

thereof upon the respective sides of the partition *a* at the same relative position to the bottom pieces *x* and *y*, as shown in the drawing.

It is sometimes preferable, and I claim the right, to make a close-jointed and metallic-lined recess, *s s*, immediately under the edges of the bottom pieces *x y*, and extending a few inches into the interior from the front, into which recess the gutters *z z* can discharge the drip from the ice; and in such event the waste-pipe z^1 does not reach to the gutters *z z*, but is firmly and securely soldered to the bottom of the recess *s s*, so as to drain it of the water which is drained from the gutters *z z*. When thus arranged the metallic curved plate K is abridged so as to cover the recess *s s*.

When ice *i* is placed upon the rack *c'* in the ice-chamber C, the air which is in immediate contact therewith will settle toward the bottom of the ice-chamber C, and will thence pass through the openings *d d* and fall toward the bottom of the provision-chambers B B. The cold air thus falling will displace that of a less frigid temperature, which latter will rise and pass through the narrow spaces *c c*, and will impinge upon the ice *i*, which will absorb its moisture, and again be precipitated in a dry and frigid state into the provision-chambers, thus keeping the latter dry and thoroughly ventilated. The drip from the ice, after falling on the curved strip K and the bottom pieces *x* and *y*, is caught in the gutters *z z*, whence it is carried off by the waste-pipe z^1.

I do not claim an outside box and inside provision-chamber or their combination; neither do I claim the fixed air-space between the two, or other method of insulation; neither do I claim the principle of ventilating the provision-chambers by means of a descending current of cold air displacing and causing to ascend the less frigid air; nor do I claim the partitioning of the provision-chamber into two compartments; nor yet do I claim the affixing the trap or siphon to the waste-pipe.

Having thus fully described my invention, and disclaimed so far as seems needful, what I claim as new, and desire to secure by letters patent, is—

In combination with the provision-chambers B B, the ice-chamber C, having rack *c'* and double-inclined bottom pieces *x* and *y*, provided with a central opening guarded by the deflector-plate K, and provided, also, with the side passage *c* from the provision-chamber and the trough *z*, and pipe *z*, all substantially as described and shown, for the purpose set forth.

RICHARD T. HAMBROOK.

Witnesses:
JNO. LEWIS.
H. C. WHITNEY.

556 DEFENDANT'S EXHIBIT FISHER PATENT, No. 133,147, OF 1872. Hugh E. Wilson, Notary Public, Kent County, Michigan. Filed May 28, 1890. C. L. Fitch, Clerk.

558 UNITED STATES PATENT OFFICE.

J. HYDE FISHER, of Chicago, Illinois.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 133,147, dated November 19, 1872.

To all whom it may concern:

Be it known that I, Joseph Hyde Fisher, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful improvement in refrigerators, of which the following is a specification:

This invention relates to a new and useful improvement in refrigerators, having particular reference to a refrigerator for which letters patent of the United States were granted me, dated August 1, 1865, and reissued the 31st day of January, 1871, which present invention consists mainly in an air-space beneath the ice-chamber, arranged as hereinafter more fully described.

(Here follows diagram marked p. 557.)

In the accompanying drawing, figure 1 is a vertical longitudinal section of the refrigerator taken on the line *x x* of Fig. 2. Fig. 2 is a vertical cross-section of Fig. 1 taken on the line *y y*.

Similar letters of reference indicate corresponding parts.

A represents the ice-chamber or compartment. B B are compartments provided with shelves for refrigerating and preserving fruits, provisions, and other articles. The walls of the refrigerator are made double, and filled with non-conducting material, as indicated in the drawing. The main features which distinguish my refrigerator from other inventions for a similar purpose, as well as the mode of constructing it and arranging the chambers, &c., being minutely described in my said reissued letters patent, require at this time no particular description; suffice it to say that my improved refrigerator is provided with a double bottom, A, between the ice-chamber and the refrigerating or provision chambers, the lower portion of the bottom being of wood and the upper portion being metal, as seen in the drawing. Between these two parts is the air-space C, which constitutes my present invention. The circulation of air within the refrigerator is indicated by the arrows. D is an air-channel directly back of the ice-chamber, which is in communication with the chambers B B. The cold air descends from the ice-box through the openings E into the chambers B B, as indicated, and forces the warmer air in those chambers upward through the channel D, and in contact with the ice, from whence it

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v.
Challenge Corn
Planter Co.
} p. 557

J. H. FISHER.

Improvement in Refrigerators.

No. 133,147. Patented Nov. 19, 1872.

Fig. 1

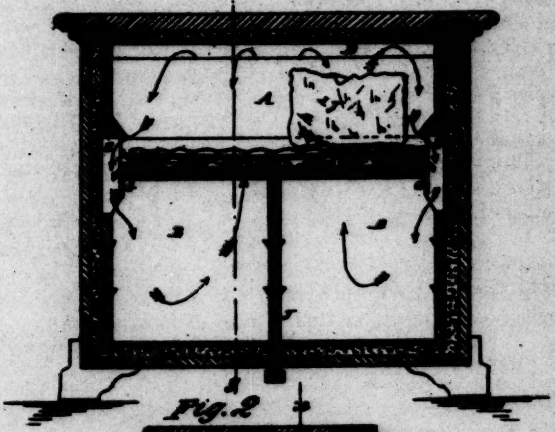
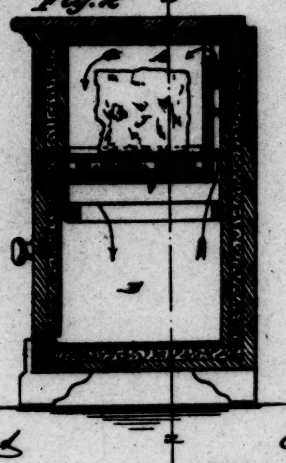


Fig. 2



Witnesses:
A. W. Almquist
C. Sedgwick

Inventor:
J. H. Fisher
Per [illegible]
Attorneys.

again descends. The circulation is maintained by the specific gravity of the air, the cold air constantly descending and displacing the warmer air below. The air-space C, being separated from the ice by only the metallic portion of the double bottom, the air therein partakes of the temperature of the ice, and assists in keeping up the circulation. In this space there is a series of longitudinal slats, F, upon which the upper or metallic portion of the bottom rests, which divide the space C into four (more or less) longitudinal channels, running the entire length of the bottom and communicating with the cold-air openings F at each end of the refrigerator. G G are metallic pieces secured at the front and rear, which support the double bottom. These pieces extend down into the provision-chambers below the bottom, and thereby confine the warm air and compel it to ascend through the rear channel D to the ice-chamber, as stated. I is the waste-water pipe, placed in the vertical partition which separates the provision-chambers. J represents a cake of ice in the ice-chamber.

Refrigerators with this improvement may be made of any size, and with a different arrangement of the chambers to suit the various purposes for which they may be required.

Having thus described my invention, I claim as new and desire to secure by letters patent—

The ice-chamber A and provision-chamber B, connected by separate passages D E, combined with the intermediate air-chamber C, opening into downward channel E, and with the supporting-pieces G G, as and for the purpose described.

J. HYDE FISHER.

Witnesses:
FRANK BLOCKLEY.
ALEX. F. ROBERTS.

560 UNITED STATES PATENT OFFICE.

D. W. C. SANFORD, of St. Louis, Missouri.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 13802, dated November 13, 1855; Reissue No. 455, dated April 21, 1857.

To all whom it may concern:

Be it known that I, D. W. C. Sanford, of St. Louis, in the county of St. Louis and State of Missouri, have invented an improvement in refrigerators; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, of which—

(Here follows diagram marked p. 559.)

Figure 1 is a perspective view exhibiting the interior of the refrigerator; Fig. 2, a vertical middle section, and Fig. 3 a perspective of a smaller-sized refrigerator with one of the apartments contracted.

My invention consists in an improvement in refrigerators, whereby the whole of the contained air is kept in continual rotation, purification, desiccation, and refrigeration, and with economy of ice.

The circulation of the air of my refrigerator is entirely confined, and consists of a continuous movement or rotation of the air confined within the apartment without any communication with the external air except when it becomes unavoidable from opening the refrigerator. I have found for purification that external air is not necessary, and it is obvious that any arrangement by which a current of external air after being cooled is passed through the refrigerator must be attended with a great consumption of ice, and that any arrangement which admits of stagnation of air in any part of the refrigerator, and does not compel circulation of the air throughout the entire apartments, is highly objectionable. Both of these conditions I have avoided, as will be seen from the following description:

Fig. 1 exhibits clearly the arrangement of the interior of my refrigerator. Within a suitable casing, A, I insert a partition, B, with openings B′ B″, at top and bottom, so that there is free communication between the apartments C and D. At a high point in one of the apartments I place the ice-receptable E. This receptacle is perforated on the sides and bottom, so as to allow free passage of air through and in contact with the ice. The ice is prevented from coming into contact with the sides of the receptacle by the projections F F, which in this case are made by punching the holes in such a way that a portion of the metal is protruded, as seen at F F.

Defendant's Exhibit Sanford Reissue Patent 455.
Hugh E. Wilson
Notary Public
Kent County
Mich.

D. W. C. Sanford.
Refrigerator.
No. 455. Reissued Apr. 21. 1857.

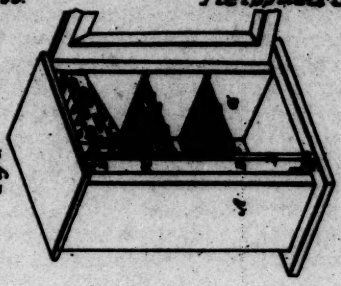


Fig. 1

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C. L. Gitch
CLERK.

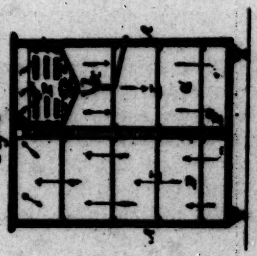


Fig. 2

No. 235.
Aldrin Mfg Co
v
Challenge Corn
Planter Co
p. 559

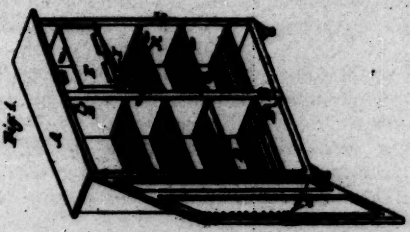


Fig. 1

The bottom of the ice-receptacle is funnel-shaped, so as to conduct the water of the melting ice to a central discharge, I, whence it falls into the cup or flaring end of the escape-pipe K. This pipe passes directly out through the side of the refrigerator, and it is important that the escape-pipe should occupy as little room possible in order not to obstruct the motion of the air. The shelves L are perforated to allow of the free transit of air, and it will now be readily seen that when the ice is placed in its receptacle and the refrigerator closed, the whole of the contained air will be set in motion and continue to circulate or revolve as long as there is any ice or refrigerating material in the receptacle.

The operation is as follows: The denser air in contact with the ice and walls of the receptacle descends and its place is immediately supplied by warmer air from apartment D through the opening B'. The dense air descending through the entire apartment C and passing through the opening B^2 keeps up a continual displacement of the whole of the contained air of the refrigerator. The apartment D has a higher temperature than apartment C, and the temperature varies with a gradual rise from the time the air leaves the receptacle until it arrives at the upper part of apartment D. It is evident that the rotation of the air will continue until the ice is melted, and an equilibrium of temperature takes place throughout the entire refrigerator. As the air passes through the apartments it imbibes moisture from fruits, vegetables, meats, and other articles, and when it comes into contact with the ice its capacity for moisture is diminished by condensation and the moisture is condensed upon the ice and passes off with the waste water. The circulating air thus being continually desiccated every part of the apartments is kept from mold and dampness. The exhalations and odor of meats and other articles are also precipitated upon the ice with the condensed vapor, and thus the entire apartments are kept sweet.

It is well known that mold will not generate in a current
561 of air, and it is known that when once formed it propagates itself and spreads with rapidity; therefore, if any one part of the refrigerator be out of the direct course of circulation the air will stagnate there and develope mold, which will contaminate the whole apartment.

The apartment D may vary in width, and it may be, as shown in Fig. 3, so narrow as to serve merely as a passage for the ascending current of air, the greatest benefit being always derived from the downward current in apartment C.

I am aware that various devices have long since been known for causing the internal circulation of air in apartments of houses and refrigerators; but I am not aware that in any instance a complete and continued rotation, purification, desiccation, and refrigeration of the whole of the contained air of a refrigerator has been compelled under the same arrangement as in my improvement; therefore,

What I claim as my improvement in refrigerators is—

1. The employment of an open-bottom ice-box, or equivalent thereof, in combination with a dividing partition open above and

below, so placed that by means of self-operating internal circulation the whole of the contained air shall be kept in motion and caused to revolve around this partition in currents moving downward only on one side of this partition and upward only on the other side, when the same is combined with a chamber for the refrigeration of food or provisions placed directly under said ice-box, as set forth.

2. I do not claim by itself a partition dividing vertically one compartment of a refrigerator from another; nor do I claim placing articles to be refrigerated in a descending current of air; but I do claim placing shelves or fixtures for holding articles to be refrigerated, or the articles themselves, in the descending current directly under an open-bottom ice-box, in combination with a dividing partition open above and below, as set forth.

3. In combination with said shelves or fixtures so placed, constructing the open bottom of the ice-box in such manner that the air may pass freely down through the same and fall directly from the ice upon the articles to be refrigerated, while at the same time the drip of the water is prevented, as set forth.

D. W. C. SANFORD.

Witnesses:
CHAS. G. PAGE.
R. T. CAMPBELL.

2 Sheets—Sheet 1.

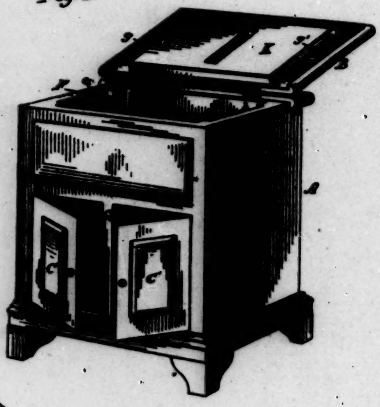
G. F. SMITH.

Assignor, by mesne assignments, of three-fourth interest to C. W. Weeks, H. C. Smith & A. R. Colegrove.

Refrigerator.

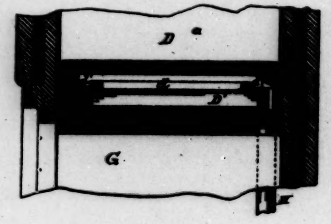
No. 8,463. Reissued Oct. 22, 1878.

Fig. 1.



No. 235.
Belden Mfg. Co.
& Challenge Corn Planter Co. } p. 563

Fig. 4.



Witnesses:
C. Clarence Poole
R. A. Dyer

Inventor
George F. Smith
by Lyon & Dyer
Attys

2 Sheets—Sheet 2.

G. P. SMITH.

Assignor, by mesne assignments, of three-fourth interest to C. W. Weeks, H. C. Barry & A. B. Colburn.

Refrigerator.

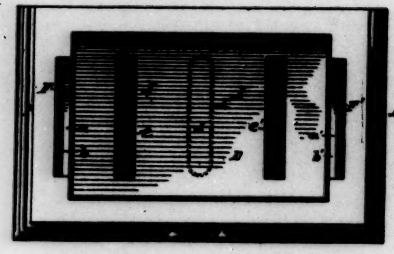
No. 8,463. Reissued Oct. 22, 1878

Fig. 2.

No. 235 Baldwin Mfg. Co. to Challenge Corn Planter Co.

Sheet

Fig. 3.



Witnesses:

C. Clarence Poole

R. A. Dyer.

Inventor:

George F. Smith

by Geo. W. Dyer & Co.

Attys.

562 DEFENDANT'S EXHIBIT SMITH REISSUE PATENT 8463. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

565 UNITED STATES PATENT OFFICE.

GEORGE F. SMITH, of Michigan City, Indiana, assignor, by mesne assignments, of three-fourths interest to C. W. Woods, H. C. Smith, and Abram R. Colborn.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 193,563, dated July 24, 1877; Reissue No. 8463, dated October 22, 1878; application filed July 25, 1878.

To all whom it may concern:

Be it known that I, George F. Smith, of Michigan City, in the county of La Porte and State of Indiana, have invented a new and useful improvement in refrigerators; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to that class of refrigerators wherein a constant circulation of air is maintained through the ice-box and provision-chambers; and its object is to increase the circulation, reduce the air to a lower temperature than heretofore, and to deliver such air into the provision-chambers deprived of all odor and free from moisture, preventing the sides of said provision-chambers from sweating, and better preserving the articles placed therein.

My invention therein consists in the combination of an ice-box of the entire width of the refrigerator except the air-passages at its end, said ice-box having a central air-discharge opening in its bottom, the provision-chambers, and the air-passages leading out of the same; also, in the combination of the same elements and an air-discharge opening above the center of the ice-box; also, in the combination of the ice-box with the central air-discharge opening and a false bottom, raised above the bottom of the ice-box, having openings near its ends and an air-passage under it; also, in the combination of the various principal operative parts, all constructed and arranged as more fully hereinafter explained.

To enable others skilled in the art to manufacture my refrigerator, I proceed to describe the same, having reference to the drawings, in which—

(Here follow diagrams marked pp. 563 & 564.)

Figure 1 is a perspective view of the refrigerator with the cover thrown open; Fig. 2, a central vertical section of the same with the cover closed; Fig. 3, a plan view of the refrigerator, the top

being removed; and Fig. 4, a central vertical section from front to rear of the middle portion of the refrigerator.

Like letters denote corresponding parts in each figure.

A represents the body of the refrigerator, which is constructed with double walls, the space between these walls being filled with non-conducting material, as shown. B is the cover to the ice-box, and C C′ doors opening into the provision-chambers.

In the top of the refrigerator is situated the ice-box D, which occupies the entire upper portion of the refrigerator the width of the provision-chambers, with the exception of the air-passages at the ends of the ice-box, hereinafter shown by the letters F F′, and which is separated from the provision-chambers E E′ below it by a horizontal partition D′. Both the ice-box and the provision-chambers are lined with zinc in the usual manner. At the ends of the ice-box are thin vertical partitions *a a′*, supported a short distance from the walls of the refrigerator, so as to form between them and such walls air-passages F F′, which lead from the tops of the provision-chambers, and open into the recesses *b b′* in the walls of the refrigerator, as shown in Figs. 1 and 3.

The provision-chambers E E′ are provided with any suitable number of racks, (not shown,) and are separated from each other by a central partition, G, running from the front to the rear of the refrigerator. This partition does not rise quite to the horizontal partition D′, but an open space, *c*, is left at the top of the same, which connects the two provision chambers. Above this space, in the horizontal partition D′, is cut an opening, *d*, and around the edge of this opening the lining of the ice-box is turned up, as shown at *d′*, to prevent the waste water from running through the same.

H is the waste-pipe, extending from the bottom of the ice-box down through the partition G and out at the bottom of the refrigerator. I is a false bottom, made of wood, and supported above the floor of the ice-box by two or more longitudinal strips. This bottom is covered with a sheet of zinc, and has cut through it, near its ends, two openings, *e e′*, forming under such bottom an air-passage, *f*, leading to the central opening, *d*.

566 To the under side of the cover B is attached a shallow air-box, K, which hangs down into the ice-box and is covered with zinc. This box is open at the ends the width of the recesses *b b′*, and has strips *g g′*, Figs. 1 and 2, which set into and occupy a part of the space of such recesses, thus cutting them off from the ice-box when the cover is closed, and connecting the air-passages F F′ with the air-box. Through the center of the air-box K is cut an opening, *h*, leading into the ice-box. A cake of ice, L, is represented in Fig. 2 in position in the ice-box.

It will be observed from the foregoing description of the construction of the refrigator, and from inspection of the drawings, that the ice-box occupies substantially the entire upper portion of the refrigerator the width of the provision-chambers beneath it. This construction is deemed important, as thereby not only a large chamber is provided for the reception of ice, but in this chamber there is

room for the refrigeration of a large body of air, and, the outlet for the discharge of this air into the provision-chamber being small, all the air is detained in the ice-box chamber until it is perfectly cool. By this construction, also, the air-discharge passage out of the ice-box may be located centrally over the inner sides of the provision-chambers, and the air-passages out of the provision-chambers may be located around the ends of the ice-box and over the outer sides of the provision-chambers.

From this construction and location of the ice-box in reference to the provision-chambers and to the cover with its central air-discharging opening, it is apparent that it permits, first, a central discharge of the heated and vitiated air from the provision-chambers into the upper center of the ice-box; second, that it permits this air, after it is cooled, purified, and dried, to be discharged centrally out of the bottom of the ice-box; third, that this air is discharged into the provision-chambers near the center of the refrigerator; and, fourth, that this air is discharged out of the upper outer sides of the refrigerator at the greatest practicable distance from the inlet, all of which will be now explained in the following description of the mode of operation.

The movements of the air-currents in this refrigerator are shown by arrows in the drawings, and are described as follows: It being understood that the ice-box is properly charged with ice, and that this box and the provision-chambers are filled with air, and that the doors are closed and the covers shut down, it follows that the temperature of the air in the ice-box is immediately reduced by the presence of the ice to a point below the temperature of the air in the provision-chambers. This cooled air at once descends, having a greater specific gravity, finding its way through the air-passages under the false bottom and into the inner upper portions of the provision-chambers. By the pressure of this intruding body of cooled air the warmer air contained in the provision-chambers is forced out of them through the air-passages F F′ at the ends of the ice-box and into the connecting air-passages of the air-box of the cover, and thence out through its central opening upon the top of the ice in the ice-box. The air which thus impinges upon the top of the ice is immediately cooled, and, following the current already established, moves over and around the ice and into the air-passages under the false bottom, and is again discharged centrally into the provision-chambers, as before described.

It is apparent that the pressure of the descending cool air into the provision-chambers must principally be on the inner or partition G sides of the chambers and extend quite to the bottom of the same, and that the escape of the warmer air must be upon the outer sides of the provision-chambers, on account of the comparatively small areas of the inlet and outlet passages, which would prevent a direct current from one to the other, from which it follows that all the warmer air in such chambers is constantly swept out by the cooler air which displaces it. This warmer air thus swept out is compressed in the comparatively small and narrow air-passages around the ends of the ice-box, and in the air-box to the cover, and conse-

quently issues with a small rapid current directly upon the top of the ice, where it is instantly dispersed over the ice. In this way not only all the air in the provision-chambers is forced directly into contact with the ice and is at once cooled, but in the act of cooling and by the contact with the ice is purified and deprived of all the odors emitted from the articles in such provision-chambers.

The ice resting centrally upon the false bottom, the circulating air is thrown into contact with the metal covering of the air-box K and against the sides of the ice-box, and the moisture in the same is condensed mostly before it passes through the openings in the false bottom. Then passing along the channel *f*, the moisture in the air is further condensed upon the metal bottom of the ice-box and enters the provision-chambers comparatively dry, thus preventing the sweating of such provision-chambers, and better preserving the articles contained therein. The water caused by this condensation and by the melting of the ice runs into the bottom of the ice-box, and is carried off by the waste-water pipe H, it being prevented from passing through the opening *d* by its upturned edge *d'*.

I do not pretend that I am the first to invent an air-chamber in the cover of a refrigerator, with a central discharge-passage over an ice-box, or that I am the first to invent a false bottom to an ice-box in a refrigerator, and I do not broadly claim the same; but

What I do claim as new and of my own invention is—

1. In a refrigerator, the combination of the following elements, viz: an ice-box the width of the provision-chambers, occupy-
567 ing the entire upper portion except spaces at each end, for ascending air-currents, a central opening in the bottom of the ice-box, provision-chambers below the ice-box, occupying the entire width, and air-passages out of such chambers around the ends of the ice-box, substantially as and for the purposes set forth.

2. In a refrigerator, the combination of the following elements, viz: an ice-box the width of the provision-chambers, occupying the entire upper portion except spaces at each end for ascending air-currents, an air-discharge opening above the center of the ice-box, a central air-discharge opening in the bottom of the ice-box, and air-passages out of the provision-chambers around the end of the ice-box, substantially as and for the purposes set forth.

3. In a refrigerator, the combination of the following elements, viz: an ice-box the width of the provision-chambers, occupying the entire upper portion except spaces at each end for ascending air-currents, a central air-discharge opening in the bottom of the ice-box, and a false bottom raised above the bottom of the ice-box, having openings near its ends only, and an air-passage under it, substantially as and for the purposes set forth.

4. In a refrigerator, the combination of the following elements, viz: an ice-box the width of the provision-chambers, occupying the entire upper portion except spaces at each end for ascending air-currents, a central air-discharge opening in the bottom of the ice-box, and a partition directly under such opening, dividing the air-currents as well as the provision-chambers and air-passages out of the

Defendants Exhibit Sanford Patent
13,803 of 1855. Hugh E. Wilson
Notary Public
Kent County
Mich

D.W.C. Sanford.
Refrigerator.
Patented Nov. 13. 1855.

No. 13,802.

FILED
MAY 28 1890
C. L. Fitch
CLERK.

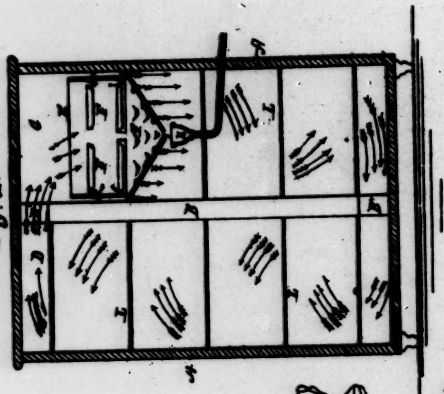


Fig. 2.

No. 235.
Belden Mfg Co
Challenge
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p. 568.

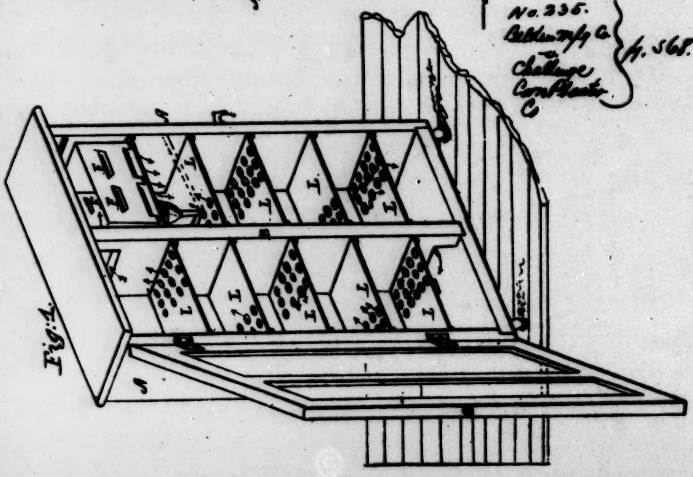


Fig. 1.

provision-chambers around the ends of the ice-box, substantially as and for the purposes set forth.

5. In a refrigerator, the combination, with the two provision-chambers E E′ and the single ice-box D, provided with openings *d*, and situated above such provision-chambers and extending the entire width of the refrigerator, of the side flues, F F′, air-box K, having openings *h*, and the false bottom I, having the side openings, *e e′*, all constructed and arranged substantially as described and shown.

GEORGE F. SMITH.

Witnesses:
H. M. HOPKINS.
C. S. GOODHUE.

569 (2–328.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

The specification in this case has not been printed. A manuscript copy will be prepared at a charge of 10 cents per 100 words. If such copy is desired please forward to the office an order to that effect.

C. E. MITCHELL,
Commissioner of Patents.

(Here follows diagram marked p. 568.)

570 DEFENDANT'S EXHIBIT SMITH PATENT, 193,563 OF 1877. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

573 UNITED STATES PATENT OFFICE.

GEORGE F. SMITH, of Michigan City, Indiana.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 193,563, dated July 24, 1877; application filed April 17, 1877.

To all whom it may concern:

Be it known that I, George F. Smith, of Michigan City, in the county of La Porte and State of Indiana, have invented a new and useful improvement in refrigerators; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to that class of refrigerators wherein a constant circulation of air is maintained through the ice-box and provision-chambers; and its object is to increase the circulation, reduce the air to a lower temperature than heretofore, and to deliver such air into the provision-chambers free from moisture, preventing the sides of the said provision-chambers from "sweating," and better preserving the articles placed therein.

My invention therein consists in the combination, construction, and arrangement of the parts for effecting the circulation of the air, as fully hereinafter explained.

To enable others skilled in the art to manufacture my refrigerator, I proceed to describe the same, having reference to the drawings, in which—

(Here follow diagrams marked pp. 571 & 572.)

Figure 1 is a perspective view of the refrigerator with the cover thrown open; Fig. 2, a central vertical section of the same with the cover closed; and Fig. 3, a plan view of the refrigerator, the top being removed.

Like letters denote corresponding parts in each figure.

A represents the body of the refrigerator, which is constructed with double walls, the space between these walls being filled with some non-conducting material, as shown.

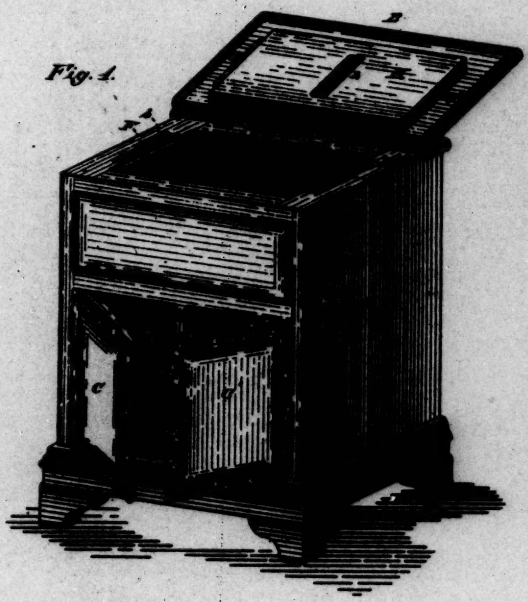
B is the cover to the ice-box, and C C′ doors opening into the provision-chambers. In the top of the refrigerator is situated the ice-box D, which is separated from the provision-chambers E E′ below it by a horizontal partition, D′. Both the ice-box and the provision-chambers are lined with zinc in the usual manner. At the ends of the ice-box are thin vertical partitions *a a′*, supported a

2 Sheets—Sheet 1.

G. F. SMITH.
REFRIGERATOR.

No. 193.563. Patented July 24, 1877.

Fig. 1.



No. 235.
Belden Mfg. Co.
v.
Challenge Corn
Planter Co.
p. 571.

Attest:
R. F. Dyer
S. H. Sellers

Inventor:
George F. Smith
by Geo. W. Dyer & Co.
Attys

No. 235
Belden Mfg Co
Challenge Con
Hauter Co.
} 1,572

2 Sheets—Sheet 2.

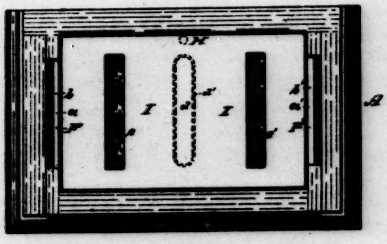
G. F. SMITH.
REFRIGERATOR.

No. 193,563.

Patented July 24, 1877.

Fig. 2.

Fig. 3.



Attest:
R. N. Dye
S. W. Bell

Inventor:
George F. Smith
by Geo. W. Dyer & Co.
Attys.

short distance from the walls of the refrigerator, so as to form between them and such walls air-passages F F′, which lead from the tops of the provision-chambers, and open into the recesses *b b′* in the walls of the refrigerator, as shown in Figs. 1 and 3.

The provision-chambers E E′ are provided with any suitable number of racks, (not shown,) and are separated from each other by a central partition, G, running from the front to the rear of the refrigerator. This partition does not rise quite to the horizontal partition D′, but an open space, *c*, is left at the top of the same, which connects the two provision-chambers. Above this space, in the horizontal partition D′, is cut an opening, *d*, and around the edge of this opening the lining of the ice-box is turned up, as shown at *d′* to prevent the waste water from running through the same. H is the waste-pipe, extending from the bottom of the ice-box down through the partition G, and out at the bottom of the refrigerator. I is a false bottom, made of wood, and supported above the floor of the ice-box by two or more longitudinal strips. This bottom is covered by a sheet of zinc, and has cut through it, near its ends, two openings, *e e′*, forming under such bottom an air-passage, *f*, leading to the central opening *d*.

To the under side of the cover B is attached a shallow air-box, K, which hangs down into the ice-box, and is covered with zinc. This box is open at the ends the width of the recesses *b b′*, and has strips *g g′*, Figs. 1 and 2, which set into and occupy a part of the space of such recesses, thus cutting them off from the ice-box when the cover is closed, and connecting the air-passages F F′ with the air-box. Through the center of the air-box K is cut an opening, *h*, leading into the ice-box.

A cake of ice, L, is represented in Fig. 2 in position in the ice-box.

In use the air in the ice-box, becoming cold, passes down through the openings *e e′* in the false bottom, along the passage *f* to the central opening, and through such opening into the provision-chambers. The warm air in the provision-chambers is displaced by the cold air, and makes its exit at the sides through the passages F F′. From them it enters the air-box K, and is discharged through the opening *h* into the center of the ice-box. A constant circulation is thus maintained. The air being taken from near the sides of the ice-box and discharged centrally into the provision-chambers, passes out at the sides of the provision-chambers, and again enters the ice-box directly over the ice contained therein.

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By circulating the air in the manner and by the means described, a more constant circulation is maintained, and the warm air, being discharged directly upon the ice, is reduced to a lower temperature than heretofore.

The ice resting centrally upon the false bottom, the circulating air is thrown into contact with the metal covering of the air-box K, and against the sides of the ice-box, and the moisture in the same is condensed mostly before it passes through the openings in the false bottom. Then, passing along the channel *f*, the moisture in

the air is further condensed upon the metal bottom of the ice-box, and enters the provision-chambers comparatively dry, thus preventing the sweating of such provision-chambers, and better preserving the articles contained therein.

The water caused by this condensation and by the melting of the ice runs into the bottom of the ice-box, and is carried off by the waste-water pipe H, it being prevent*ing* from passing through the opening *d* by its upturned edge *d'*.

Having thus fully described my refrigerator, and explained some of its advantages, what I claim as my invention, and desire to secure by letters patent, is—

In a refrigerator, the combination, with the two provision-chambers E E' and the single ice-box D, provided with opening *d*, and situated above such provision-chambers, and extending the entire width of the refrigerator, of the side flues F F', air-box K, having opening *h*, and the false bottom I, having the side openings *e e'*, all constructed and arranged substantially as described and shown.

This specification signed and witnessed this 5th day of April, 1877.

GEORGE F. SMITH.

Witnesses:
CHARLES W. WOODS.
HENRY C. SMITH.

Defendants Exhibit Lyman Patent 14,510 of 1856
Hugh E. Wilson
Notary Public
Kent County
Mich.

A. S. LYMAN.

Air Cooler.

No. 14,510. Patented March 25, 1856.

No. 235.
Belden Mfg. Co.
v.
Challenge Corn
Planter Co.
p. 575

FILED
MAY 28 1890
C. L. Fitch
CLERK.

Fig. 1

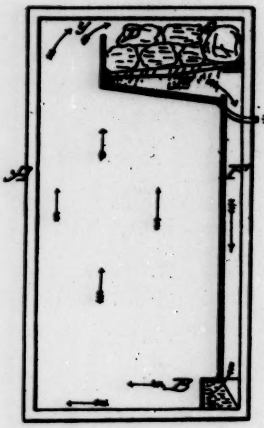
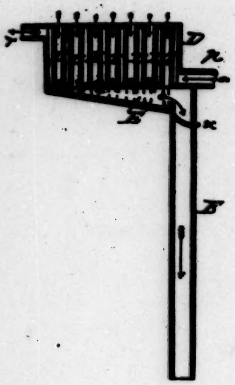


Fig. 2



576 DEF'T'S EXHIBIT LYMAN PAT., 14510, 1856.

UNITED STATES PATENT OFFICE.

AZEL STORRS LYMAN, of New York, N. Y.

Improved Method of Cooling and Ventilating Rooms, &c.

Specification forming part of Letters Patent No. 14510, dated March 25, 1856.

To all whom it may concern:

Be it known that I, Azel Storrs Lyman, of the city, county, and State of New York, have invented certain new and useful improvements in cooling, drying, and disinfecting rooms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawing, making a part of this specification—that is to say:

(Here follows diagram marked p. 575.)

My improvement in cooling, drying, and disinfecting consists in the peculiar construction of the box or reservoir for holding the ice or other cooling material. The object sought to be accomplished by this construction is the production of a blast or current of cool air in a determined direction without mechanical aid and irrespective of place. The principle I employ is that which is exemplified in the hydrostatic column, and my use of it may be understood by the following comparison: If we suspend a cake of ice freely in the air and near to the ceiling of a closed room, slight currents would soon be produced by the disturbance of the equilibrium consequent upon the cooling of the air in contact with the ice. These currents would be feeble, because the cold descending air would spread out over a wide base and the temperature soon become equalized by mixture with warm air. If, however, we should place under the ice a pipe of sufficient size to surround the ice, the air as it cooled would fall down and soon fill the pipe, but still have a tendency to spread laterally in consequence of its gravity, and therefore it would exert pressure on all sides similar to a non-elastic fluid. If a plug were now pulled out of the bottom of the pipe, this air would pour out with a certain force, due to the difference of temperature outside and inside and to the height of the column, obeying precisely the same laws which would govern a non-elastic fluid. The construction of a refrigerating box on this principle enables me to employ it to various useful and valuable purposes—such as the preservation of meats and vegetables, ventilating, cooling, drying, and disinfecting apartments in hospitals, sleeping and other rooms—all of which will appear in the following description of the construction and operation of my refrigerating apparatus.

This apparatus consists of three parts—viz., a reservoir or receptacle

for the cooling material, a cold-air chamber, and a conduit or blast-pipe. The reservoir, when adapted for holding ice as the cooling material, is a box open at the top, and as shown at D, figure I. This is divided into two compartments by a grating, the latter serving to support the ice, while the space beneath forms the cold-air chamber E, which allows of the free settling of the cold air from all parts of the grate.

At F is the conduit. This is a trunk or pipe attached to the cold-air chamber, and may be of differing lengths, according as the blast is to be more or less forcible, the higher the column the greater being the weight and velocity of the discharge.

I will now describe the manner of application, together with some of the various uses to which the instrument may be put. When inclosed within an air-tight compartment, as shown in Fig. I at A, and the box D charged with ice, the moisture will be extracted from the air at the same rate that its temperature is reduced, in the following manner: The air in A is at first of the temperature of the surrounding media, and its hygrometrical condition is the same. Ice being now introduced into the box D, the air in contact will be immediately reduced in temperature, condensation takes place, and moisture is deposited. The condensed air, being of greater specific gravity, falls into the air-chamber E, flowing thence into F. Here, as it cannot spread out and commingle with the external and lighter air, it drives that already in the pipe before it and out at the bottom, finally pouring out itself in a continuous stream. Once out it still continues to act similar to the flow of water, spreading over the floor, and in doing so displaces the lighter and warmer air, forcing the latter upward toward the top of the apartment. As it there comes in contact with the ice, the condensation and precipitation of moisture go on until a minimum temperature is reached. Thus a continual circulation is kept up in such manner that the whole of the air must circulate through the ice-box. Of course all articles such as meats and vegetables would be deprived of the moisture in a like degree with the air, the latter being brought to the condition of great purity and dryness. As the water collects, it falls to
577 the bottom of the cold-air space E, whence it is discharged to the outside by a suitable pipe, as shown at *x*. In cooling living-rooms, dairies, &c., I propose, where the locations allow of it, to employ cold spring or well water as the cooling element for the production of the blast, and for this purpose the refrigerator will be modified in so far as concerns the cooling-box. Such modification is shown in Fig. II, the box D being a tank capable of holding water, having an inlet at *p* and an outlet at *r*. A series of tubes (arranged vertically will be best) is set in the box, as shown at I. These open into the cold-air box E in the same manner as for the ice-box, there being a conduit, F, as before. The cold well or spring water may be made to flow through *p* by a "ram," or otherwise, and, filling up D, discharges at *r*, thus surrounding and cooling all the tubes I. As the air within is cooled, it descends into E, flowing thence through F into the apartment to be cooled, and as the cooling goes on the moisture condensing from the air will be deposited

upon the sides of the tubes, and trickling down will fall into the trap in E and be discharged, and the operation will be otherwise as before described. By this means a dairy or other room may be kept dry and cool at little or no expense for the cooling element. For disinfecting, a charcoal-box or other suitable agent may be employed, either by combining it with the cold-air pipe in manner shown at B or by placing it at *y*, where the warm and moist air passes over to be cooled and dried.

Instead of a single flue, several may be employed, in combination with one cooling-reservoir; or where the apartment is of considerable size more than one reservoir for the cooling materials and flues in like manner may be arranged either to increase the circulation or to reduce the temperature and drying, or both, as may be required.

I claim as my improvement—

In cooling, drying, and disinfecting rooms, the combination of a descending conduit or cold-air flue with a reservoir for containing cooling materials, substantially in the manner and for the purposes described.

AZEL STORRS LYMAN.

Witnesses:
J. P. PINSSON.
S. H. MAYNARD.

578 DEFENDANT'S EXHIBIT BUTLER PATENT, 161,928 of 1875. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

580 UNITED STATES PATENT OFFICE.

WILLIAM P. BUTLER, of Syracuse, New York.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 161,928, dated April 13, 1875. Application filed February 15, 1875.

To all whom it may concern:

Be it known that I, William Prentice Butler, of Syracuse, State of New York, have invented certain improvements in refrigerators, of which the following is a specification:

My invention consists, first, in the construction and arrangement of the tank or cooler for drinking-water, and its position in a refrigerator relative to the ice pan or rack, whereby room is saved in the refrigerator, and at the same time a large surface of the cooler brought in proximity to the ice, and the cooling of the water aided by the drippings from the ice without intermixing it with the former, and which facilitates the filling and cleaning of the cooler or tank; second, in the arrangement of the reservoir for the drippings from the ice, and its connection with the refrigerator, whereby the interior of the refrigerator is rendered spacious, the gases arising from the food placed therein absorbed by the water in the reservoir, the reservoir easily emptied and cleaned, and the use of pans, or other vessels usually placed under the refrigerator as a receptacle for waste-water, is dispensed with.

(Here follows diagram marked p. 579.)

In the drawing, figure 1 is a front view of a refrigerator, with the doors opened to show my improvements in position; Fig. 2, a longitudinal section of same; Fig. 3, a section through *y y* in Fig. 2, showing the interior bottom of the refrigerator and cover of reservoir partly removed to expose the overflow-tube; and Fig. 4, an enlarged view of the tank or cooler for the drinking-water.

a is a perforated movable ice pan or rack, resting on brackets or flanges attached to the refrigerator. *c* is the movable tank or cooler for drinking-water, resting on bars or supports immediately under the ice-pan. The cover of this tank is detachable or movable, either partly or entirely, for the purpose of filling and cleaning the tank, and is fitted over the sides and made convex or raised in the center sufficiently to allow the drippings from the ice-pan to pass off to the trough V underneath, from whence it is conducted by pipe *s* in the rear end to the reservoir *r* under the refrigerator. At times, when the cooler is not required, it can be removed and the ice-pan

W. P. BUTLER.

Refrigerator.

No. 161,928. Patented April 13, 1875.

No. 235.
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Planter Co.
p. 579.

Fig. 1

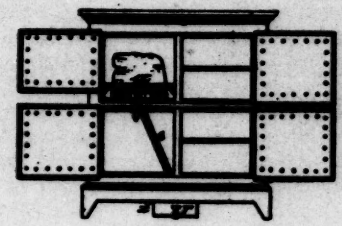


Fig. 2

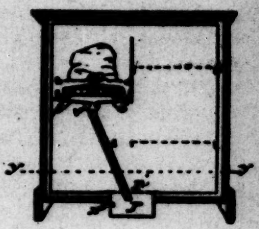


Fig. 3

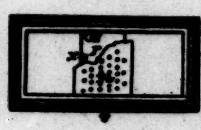


Fig. 4

Witnesses:
Chris Holmstrup
Chas. H. Hey.

Inventor:
William P. Butler
pr. E. Laass Atty.

placed in its stead, thereby obtaining additional room in the refrigerator. If it is desired to have the opening to the cooler or tank for filling accessible without opening the refrigerator, the tank may be made of sufficient length to project at the front, and that portion of the top provided with a lid. The tank is made shallow and broad, so as to occupy but little room, and at the same time bring a large surface in proximity to the ice. The cooling of the water is aided by the dripping from the ice-pan upon the cover of the tank. The water-sheds under the tank are fitted close to the sides of the refrigerator and inclined toward the center, where they have communication to the trough V, which is inclined toward the rear, and there connected with a pipe, *s*, leading to the reservoir *r*, thereby preventing any of the water entering the provision-chambers. *r* is the reservoir for the drippings from the ice, which are conducted to it by pipe *s*, as before described. This reservoir I attach under the bottom of the refrigerator for the purpose of saving room in the latter, and may be either rigid or movable, as may be desired. The top of it is open into the bottom of the refrigerator, and covered by a loose perforated plate, *n*, forming part of the bottom of the refrigerator, which is removed in cleaning the reservoir. By means of the perforated top *n* the water in the reservoir *r* is allowed to absorb the gases from the food placed in the refrigerator and the air kept pure. It is provided with a faucet in front for emptying, and an overflow or waste pipe, *x*, in its side, which can be connected with another waste pipe or siphon, thereby dispensing with the use of pans or other vessels usually placed under refrigerators as receptacles of waste-water.

Having thus fully described my improvements, I claim—

1. The movable tank or cooler *c*, having a convex cover, constructed as described, in combination with the ice-pan *a*, water-sheds *e e*, and trough V, substantially as specified and shown, for the purpose set forth.

2. The reservior *r*, provided with waste-pipe *x*, and cov-
581 ered by the removable perforated plate *n*, forming part of the bottom of the refrigerator, constructed as described, and combined with a refrigerator, substantially as and for the purpose specified.

In testimony whereof I have signed my name and affixed my seal in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga and State of New York, this 12th day of February, 1875.

WILLIAM PRENTICE BUTLER. [L. S.]

Witnesses:
CHRIS. HOLMSTRUP.
CHAS. H. HEY.

582 DEFENDANT'S EXHIBIT HUNT PATENT, REISSUE 4789 OF 1872. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, clerk.

584 4789.

UNITED STATES PATENT OFFICE.

FRANCIS W. HUNT, of East Orange, New Jersey.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 103,336, dated May 24, 1870; Reissue No. 4789, dated March 5, 1872.

To all whom it may concern:

Be it known that I, Francis W. Hunt, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful improvement in refrigerators, of which the following is a specification:

(Here follows diagram marked p. 583.)

In the drawing, figure 1 is a vertical front view, the cover of the ice-chamber, the water-cooler, and the door of the refrigerator being partly thrown open. Fig. 2 is a central vertical section of the improved refrigerator, showing the ice-chamber, the water-cooler, and the rotating shelves. Fig. 3 is a top view.

Similar letters of reference indicate corresponding parts in the several figures.

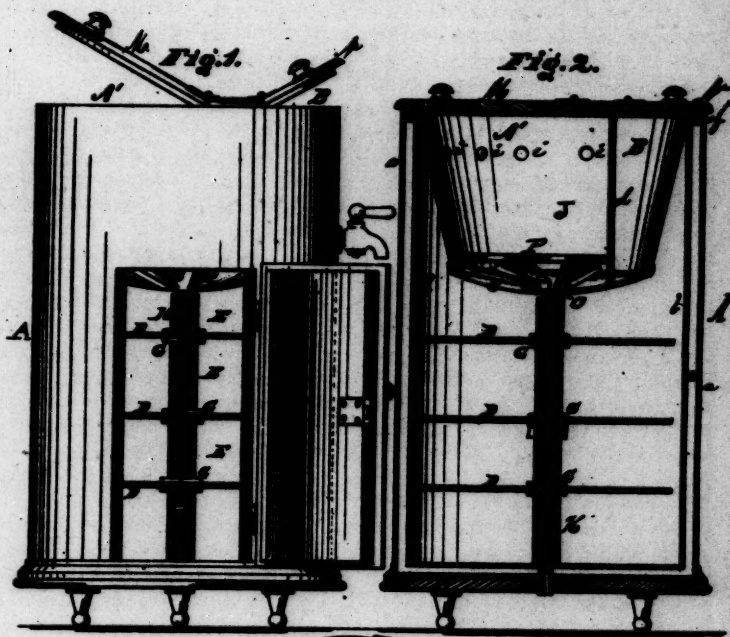
My invention relates to certain improvements in refrigerators; and it consists in combining with a refrigerator a series of rotating or revolving shelves, which are adapted to be adjusted vertically with reference to each other. It further consists of a series of shelves arranged within the provision-chamber of a refrigerator, so as to be adjusted up and down and held in position by means of screw-threads or set-screws. It further consists of the combination of a central waste-water tube with the provision-chamber of a refrigerator, and with an elevated or suspended ice-chamber, having a concave bottom and covered opening. It further consists of a combination of parts, as specified hereinafter.

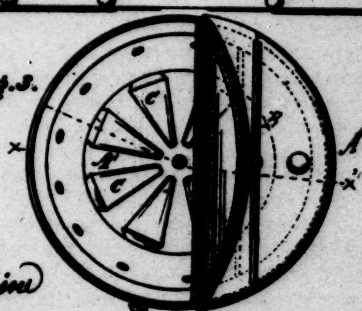
In the drawing, the letter A designates the body of refrigerator, which may be of any desirable form; but, by preference, is made cylindrical. The outside portion *a* is made of galvanized iron, (though other material may be employed,) and is provided with an inner lining or partition, *b*, so as to leave an intermediate air-tight space, *c*, between the two. An opening is made in the side of the refrigerator-body, by which access is had to what is termed the provision-chamber E. Within the provision-chamber E is arranged a vertical shaft or support, H, which is made hollow for a purpose hereinafter mentioned. Upon this shaft is mounted or secured a series of shelves, D D, which are adapted to be rotated or revolved

F. W. HUNT.

Improvement in Refrigerators.

No. 4,789. Reissued March 5, 1872.





No. 235
Belden Mfg. Co.
A Challenge Corn
Planter. Co
p. 513

Witnesses.
H. L. Perrine
John B. Morse

Inventor.
Francis W. Hunt

on the axis H. The shelves are arranged within the provision-chamber, and are adjusted vertically with reference to each other, and also in reference to the cooling-chamber, and retained in position by set-screws or by screw-threads upon their support. Above the provision-chamber E in the upper portion of the refrigerator is arranged the compartment J. This compartment is divided into two parts by a partition, *d*, whereby is formed an ice or cooling chamber, A′, and a cold-water chamber or water-cooler, B, the whole being supported by the flange *f* on the lining *b*. These chambers are provided with doors or lids M N. This ice or cooling compartment is provided with a concave bottom, and at or about the center of which is an opening communicating with a hollow support or pipe, O, which extends down through the shelf-support or axis H, and through the bottom of the refrigerator, so that water from the melted ice will be conducted down through the provision-chamber into a vessel or other medium to receive the same. A false perforated bottom, P, is arranged within the cooling-chamber A′, and rests upon suitable supports or upon the inside surface of the chamber J. Covered openings C having flanges *e e* upon their edges are arranged in the bottom of the cylinder, so as to prevent the waste water from running down into the provision-chamber. A series of perforations or openings, *i i*, are formed in the body of the ice or cooling chamber near its top, through which and the openings in the bottom of the said chamber cold air passes and circulates in the provision-chamber, thus refrigerating the articles contained therein. The cold-water chamber may contain ice, but will be kept cool by the action of the ice in the cooling-chamber.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

1. A refrigerator provided with adjustable revolving shelves.

2. The provision-chamber of a refrigerator, provided with a series of rotating or revolving shelves, arranged so as to be adjusted up and down and held in the position desired on a shaft or support by means of thumb-screws or by screw-threads formed on the said shaft.

3. In combination with the provision-chamber of a re-
585 frigerator, having the central tube or hollow shaft O, I claim the elongated ice-chamber, having its concaved bottom formed with covered openings, substantially as described.

4. The ice-chamber A′ and cold-water chamber B, in combination with the provision-chamber E, shaft and tube O, and revolving shelves D, substantially as described.

5. The combined ice and cold-water chamber J, having air-circulating openings, as described, and suspended in the top of a refrigerator by means of the flange-support *f*, in combination with the provision-chamber and adjustable shelves, substantially as described.

To the within specification I have signed my name this 3d day of January, A. D. 1872.

FRANCIS W. HUNT.

Witnesses:
WM. BRADSHAW.
A. P. YOUNG.

587 ABRAHAM YOST, of New York, N. Y.

Letters Patent No. 23803, *Dated Ap'l* 26, 1859.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Abraham Yost, of the city, county, and State of New York, have invented certain improvements in refrigerators, and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

(Here follows diagram marked p. 586.)

Fig. 1st represents a vertical section of the refrigerator, taken through the red lines *z z* of figure 3.

Fig. 2d is a horizontal section, taken through the red lines *y y* of Fig. 1.

Fig. 3d shows a transverse section, taken through the red lines *x x* of Fig. 1, in the direction of the arrows.

The nature of my invention consists in inclosing the ice within a tight metallic box and introducing the external air in immediate contact with the outside of this receptacle and circulating the same around the ice-box and from thence throughout the entire refrigerator and allowing the rarified air to pass out on either side near the top of the same through tubes and escapes — hereinafter described.

Also in the peculiar arrangement of pipes, compartments, and dampers, so that the communication of either or all may be shut off from the cold currents of air, thereby producing a great economy of ice. I am aware that various devices have been essayed
588 for producing a refrigeration, rotation, and dessic-ation of the air within refrigerators, and that the air has been introduced externally and brought in immediate contact with the ice and passed down and circulated throughout the refrigerating compartments and passed out near the top of the same, but they are all objectionable on account of their enormous consumption of ice. It will be readily seen that in my refrigerator that warm air as it enters comes in contact with a larger surface of cold metal, which instantly lowers the temperature without exposing the ice in contact with the air; it then falls down and circulates among the articles to be refrigerated, and as the temperature is raised it passes out through escapes without again being submitted to the cooler or ice-box described, represented, and specified as follows:

The outer casing A is constructed of non-conducting material, as is common with most refrigerators; within this box and near its top is arranged the ice-holder B, which is made of zinc or other suitable material; surrounding this box are spaces *c c'*, which sepa-

Defendant's Exhibit Yost Patent 23,803 of 1859
Hugh E. Wilson
Notary Public
Kent County
Mich

A. Yost.

Refrigerator.

No. 23,803. Patented Apr. 26, 1859.

FILED
MAY 28 1890
C. L. Fitch
CLERK.

No. 235.
Belden Mfg Co.
v.
Challenge
Corn Plants
Co.
12,586

Fig. 2.

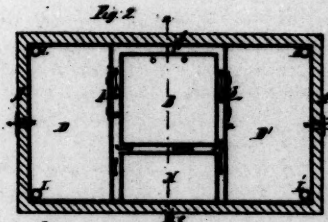


Fig. 1.

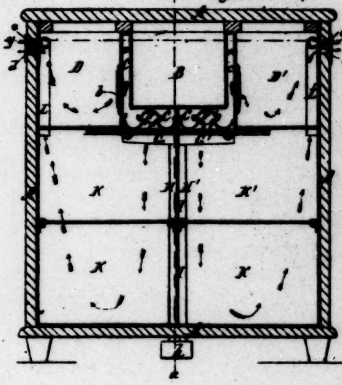
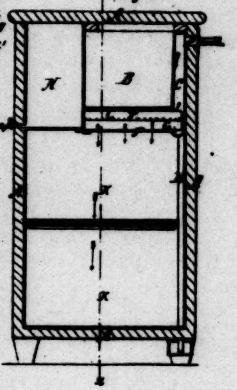


Fig. 3.



Witnesses;
W. Chesch
[illegible]

Inventor;
Abraham Gott

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

rate the ice-holder from compartments D D′ by metal partitions *a*, provided with dampers *b b′* near their bottoms.

Underneath of the ice-box is arranged the drip-pans E E′, constructed of semi-cylindrical plates, which break joints so that the downward current of air can freely pass through the pans, while the water is conducted off to pans G G′ and down through waste pipes H H′, which are placed on either side of a partition, I, and terminate in a cup, *h*, which is kept full of water and prevents the air from passing up the tubes, at the same time allowing the waste water from the ice to escape. Below the drip-pans F F′ are dampers J J′ for shutting off the communication with the compartments K K′ L L′ are tubes which are situated in the four corners of
589 the compartments D D′ and open into the compartments K K′, and convey off the air through apertures *c c′* in the sides of the refrigerator. The air is conveyed off from the compartments D D′ through apertures *d d′*. N is a reservoir for water, which is kept cool by the ice in the box B and drawn off through faucet *e*.

The operation of this refrigerator is as follows:

The ice-holder being filled with ice and the covers closed tight, the external air rushes in through aperture *f* and around the passages *c c′*, in the direction of the arrows, and when the dampers are all open it circulates through the compartments D D′ and out through apertures *d d′*; also down through the drip-pans E E′ into the compartments K K′ and out through pipes L L′. When the dampers communicating with one or two apartments are closed the cold air then circulates through those that are open, thus employing only that part of the refrigerator containing the articles to be refrigerated, and in this manner creating a great economy of ice.

What I claim and desire to secure by letters patent is—

The combination and arrangement of compartments D and K, dampers *b* and J, and escape tubes L, substantially as and for the purposes hereinabove set forth.

ABRAHAM YOST.

Witnesses:
WM. TUSCH.
W. HAUFF.

590 DEFENDANT'S EXHIBIT ROHRER PATENT, 121,899 of 1871. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

592 121,899.

UNITED STATES PATENT OFFICE.

JEREMIAH ROHRER, of Lancaster, Pennsylvania.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 121,899, dated December 12, 1871.

To all whom it may concern:

Be it known that I, Jeremiah Rohrer, of the city and county of Lancaster and State of Pennsylvania, have invented certain improvements in refrigerators, of which the following is a specification:

The object of my invention is to provide a more spacious and convenient arrangement for keeping victuals and liquors in a cold or cool temperature during the summer season, more especially adapted for restaurants, hotels, and the like.

The accompanying drawing illustrates the construction and arrangement.

(Here follows diagram marked p. 591.)

Figure 1 shows the external appearance of the case, which is, say, seven feet high and three feet wide. Fig. 2 is a vertical section of the same, to show the outer and inner walls or plates with the partitions and open shelves. Fig. 3 shows a different arrangement in the partitions below the ice-chamber, more especially adapted for hotels. Fig. 4 illustrates the parts and their arrangement constituting the ice-chamber A, which is placed at the top of the case, as shown, and with a brief description the whole will be readily understood. Fig. 5, a partitioned liquor-case for bottles.

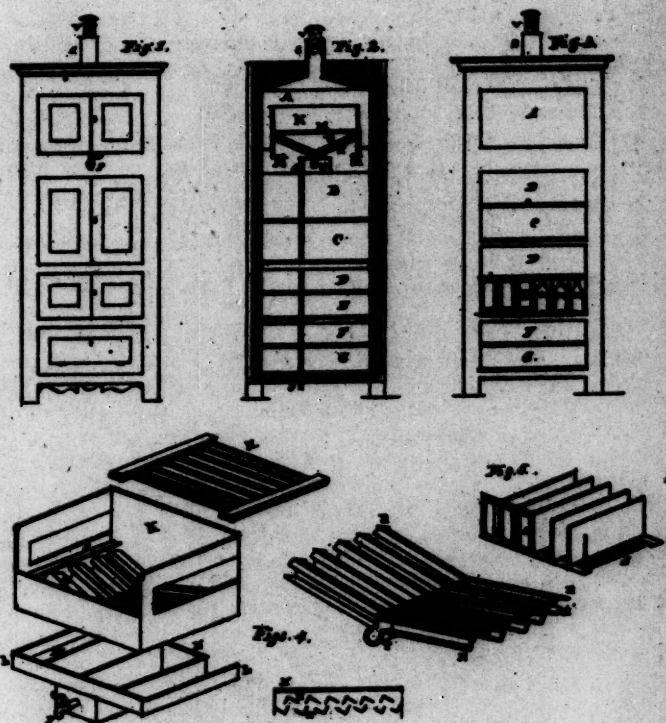
The ice-chamber A has a water-vessel or receptacle, N, centrally affixed to the side pieces L having flanges M, on which is the ice-box K with its grated shelf H and double, circulating, inclined slats, the upper ones R ridged or convex, the lower series, intermediate and concave, R′, leading to a central spout, T, which opens into the reservoir or vessel N. This has an outlet to a pipe, O, to prevent overflow. These several parts are shown detached by Fig. 4, and jointly constitute my ice-chamber. The water-vessel N is provided with a tap, P, entering from the outside. There is also a flue or tube, S, on the top of the case, with an adjustable, perforated, and capped ventilator, V, inserted.

By this arrangement I do not only increase the capacity and convenience of the several departments, but I gain an advantage in

J. ROHRER.

Improvement in Refrigerators.

No. 121,899. Patented Dec. 12, 1871.



No. 235.
Belden Mfg. Co
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Corn Planter Co
p. 591

Witnesses.

Wm. B. Niles
Jacob Stauffer

Inventor.

J. Rohrer

placing these chambers over each other, open to a free circulation. Thus, the denser cold air will pass downward, and the warmer expelled from the top, regulated by the adjustable ventilator V. This also prevents foul air, the open-grated shelves H forming no obstruction to equalizing the temperature in the lower division G, as well as in the upper, B. The arrangement of the ice-chamber A is well calculated for the purpose. A large lump of ice placed on the shelf H, any drippings will fall upon the ridged or convex draining-slats R and find their way to the concave slats or drainers R′, beneath the open spaces of the upper series, both series separated from each other and inclined to the center, allowing free circulation, but collecting all the drippings or water into a central channel or spout, T, from which it enters a vessel, N, from which the ice-water can be drawn by a tap, P. The case, Fig. 5, E, Fig. 3, is divided into six departments, each with its own door in front, (but within the outer doors, shown in Fig. 1,) and open by its grated bottom under and over it to the free action of the cold air, and is for separate bottles containing brandy, spirits, whisky, &c., marked on the door. For hotels and restaurants it will give capacity to keep mineral waters in G, ale and porter in F, Scotch ale, &c., each in its own department, and found highly desirable as an important acquisition to all who desire to keep their liquors cool and refreshing in a superior manner.

As a mere case and chambered refrigerator in itself, it may not have any special novelty; but as a whole, in combination with the construction of the ice-chamber and its appliances, I am not aware that there is anything substantially like it, or that will meet the purpose so well as this is intended to supply; therefore—

What I claim as my invention, and desire to secure by letters patent, is—

The arrangement of the ice-box K with its ledge I for the ice-supporting bars H, double series of inclined draining-slats R R′, when centrally connected over a trough, T, in combination with the ledge M, vessel N, and draining-tube O, all, in relation to each other and a vertical case, substantially in the manner and for the purpose shown and described.

J. ROHRER.

Witnesses:
W. B. WILEY.
JACOB STAUFFER.

593 DEFENDANT'S EXHIBIT PAGE PATENT, 175,143 OF 1876. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

596 UNITED STATES PATENT OFFICE.

CARTER B. PAGE, of Bladensburg, Maryland.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 175,143, dated March 21, 1876. Application filed February 26, 1876.

To all whom it may concern:

Be it known that I, Carter B. Page, of the town of Bladensburg, in the county of Prince George and State of Maryland, have invented a new and useful improvement in refrigerators and water-coolers, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to cause hot air to generate moisture upon the cold surface of the metal box which contains the ice, which moisture shall be a perfect protection to the ice within from heat without, and by the evaporation of that moisture to prevent the ice from melting, and at the same time produce intense cold.

A representation of the refrigerator is given in perspective view in figure 1 of the accompanying drawings.

(Here follow diagrams marked pp. 594 & 595.)

This machine is illustrated more in detail in Figs. 2 and 3.

The outer frame-work *a* is of wood. Within this is the frame-work *b* of galvanized iron or zinc, forming with it air-chamber No. 1. Within this again is another frame-work, *c*, of galvanized iron, forming, with the sides of chamber No. 1, chamber No. 2, thus protecting the wood-work from the moisture within, thereby preventing decay and any unpleasant odor arising therefrom.

Near the center of the refrigerator a horizontal partition, *l*, separates it into two apartments. Directly under this partition, on either side, are chimney-shaped flues *f f' h h'*, leading from the lower apartment through chamber No. 2 into the upper apartment near the top. In the upper apartment is suspended metal box A, forming, with the sides of chamber No. 2, chamber No. 3. Into this chamber, by means of air-holes *g* on either side near the top, the hot air is allowed to pass, where aqueous vapors as the air plays upon the cold surface of the ice-box are condensed into water. This air having given off its heat becomes heavy and falls, creating a partial vacuum, which vacuum is filled by warm air from without, which, in its turn, is chilled down and falls, thus producing a continuous descending current. This descending current is allowed to

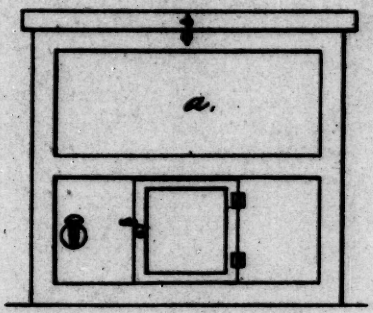
2 Sheets—Sheet 1.

C. B. PAGE.

REFRIGERATOR.

No. 175,143. Patented March 21, 1876.

Fig. 1.



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Belden Mfg. Co.
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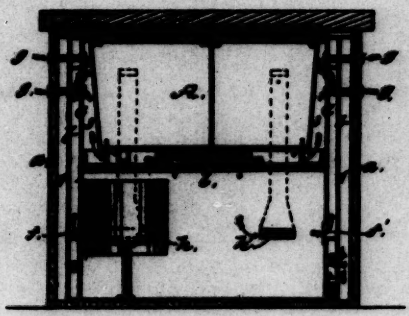
Challenge Corn
Planter Co.
p. 594

Fig. 2.



Witnesses:

Thomas C. Connolly.
A. Schuff

Inventor:

Carter B. Page.

2 Sheets—Sheet 2.

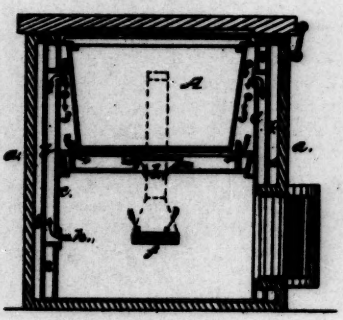
C. B. PAGE.

REFRIGERATOR.

No. 176,143. Patented March 21, 1876.

No. 235
Allen Mfg Co
v.
Challenge
Corn Planter Co.
} p. 595.

Fig. 3.



Witnesses:

Thomas G. Connolly.
A. Schuff

Inventor:

Carter B. Page

pass through the horizontal partition into the lower apartment, where it displaces the warm air and forces it up through the chimney-shaped flues into the upper apartment, which, coming in contact with the cold surface of the ice-box, is also chilled down and falls, leaving a vacuum to be filled by the rushing in of more hot air.

By means of this ascending and descending current, the air is kept in constant circulation, which, as it plays around the surface of the ice-box, which has now become perfectly saturated with moisture, will evaporate that moisture, and in so doing will extract heat from surrounding objects, and the latent heat from the ice itself.

Under the ice-box, in the lower apartment, is a water-cooler, constructed on the principle described above, around which a current of air is made to circulate to evaporate the moisture generated thereon. A metal tube, extending down into the cooler, connects it with the ice-box, and imparts to the water a degree of coldness that renders it unnecessary to use the ice for that purpose.

The ice-box is divided into separate apartments, and when a greater intensity of cold is desired, a metal box containing salt and cracked ice may be inserted.

Not the least feature of this machine is, that none of its parts, except the water-cooler, are stationary, and may be removed, cleansed, and replaced at pleasure.

I claim as my invention—

1. The combination, in a refrigerator-case, of an apertured drip-pan, extending closely to the sides of the case, a close-sided ice-box apart from the sides of the case and bottom of the pan, and one or more flues connecting the space about the ice-box with the inferior food-chamber, as and for the purpose described.

2. In a refrigerator case, the combination of an apertured drip-pan forming a partition, a close-sided and isolated ice-box, one or more flues connecting the air-spaces about the ice-box with air-passages from the exterior of the case, to the space about the ice-box, as and for the purpose described.

CARTER B. PAGE.

Witnesses:

THOMAS C. CONNOLLY.

A. SCHOEPF.

597 DEFENDANT'S EXHIBIT. LAW PATENT, 62643 OF 1867. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

599 UNITED STATES PATENT OFFICE.

WILLIAM LAW, of New York, N. Y.

Letters Patent No. 62643, dated March 5, 1867; antedated December 31, 1866.

Improved Refrigerator.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, William Law, of the city, county, and State of New York, have invented a new and useful improvement in refrigerators; and I do hereby declare that the following is a full, clear and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

(Here follows diagram marked p. 598.)

Figure 1 is a vertical longitudinal section of my improved refrigerator, taken through the line *y y*, Fig. 2.

Figure 2 is a vertical cross-section of the same, taken through the line *x x*, Fig. 1.

Similar letters of reference indicate like parts.

My invention has for its object to so improve the construction of refrigerators that the bottom of the ice-chambers may not be liable to be injured by an accidental blow of the ice-pick; and it consists in forming the bottom of the ice-chamber of corrugated cast iron, and in forming the bottom of said ice-chamber double, the whole being constructed as hereinafter more fully described.

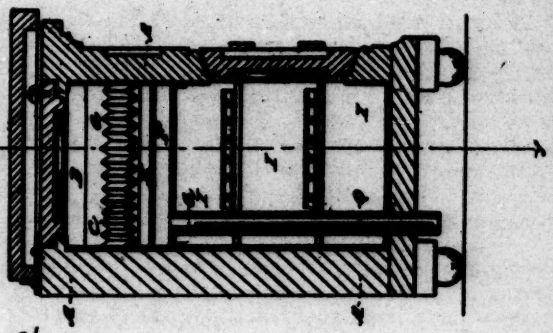
The walls A of the refrigerator are made double, the space between them being filled with some non-conducting material in the ordinary manner. B is the ice-chamber, the bottom C of which is formed of plates of corrugated cast iron. At the sides of the chamber B the bottom C extends close up to the walls of the refrigerator, as shown in Fig. 2; but at the ends there is a space, D, left, as shown in Fig. 1. The plates C are set inclined towards the center, and a space, E, is left between them, as shown in Fig. 1. The plates C may be cast with corrugations upon one or both sides, as may be desired. F is a chamber or trough, crossing the refrigerator from side to side, beneath the space E, in such a position that, as the ice melts, the water may flow from the corrugated bottom C into the trough

W. LAW.

Refrigerator.

No. 62.643. Patented March 5, 1867.

Fig. 2



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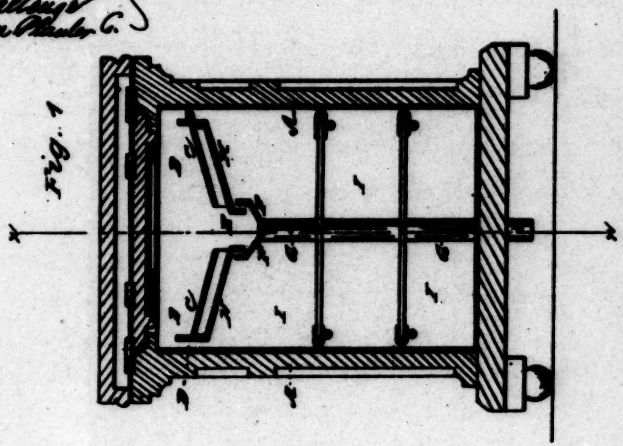
p. 598

Fig. 1



Witnesses:

Thos. Tusche

J. A. Serovic

Inventor:

Wm. Law

Per Munn & Co.

attorneys

F, and be carried off through the pipe G. H is a second bottom, placed a short distance beneath the bottom C. This second bottom may be made of zinc, or any other suitable material, and it is designed to prevent the air that rises from the provision-chamber I from having its moisture condensed by coming in contact with the cold under side of the plates that support the ice, and thus dropping back into the said provision chamber and injuring its contents. By constructing the bottom of the ice-chamber of cast iron in the manner herein described, it will be impossible for it to be injured or perforated by the ice-pick, which so frequently happens in the case of refrigerators constructed in the ordinary manner. In using the refrigerator, the air, cooled by contact with the ice in the ice-chamber B, passes down through the space E, and into the provision-chamber I, through the spaces between the upper edges of the sides of the trough F and the under sides of the second bottom H, where it comes in contact with the contents of said chamber I, abstracting the warmth therefrom. It then rises through the spaces D into the ice-chamber B, to become again cooled, thus keeping up a constant circulation through the interior of the refrigerator.

What I claim as new, and desire to secure by letters patent, is—

The construction and arrangement, within the walls A, of the corrugated inclined plates C, and bottom H, in such a manner as to prevent the air that rises from the provision-chamber I from having its moisture condensed by contact with the bottom of the plates C, and dropping back into the said provision-chamber, as herein set forth.

The above specification of my invention signed by me this 24th day of December, 1866.

WM. LAW.

Witnesses:
WM. F. McNAMARA.
JAMES T. GRAHAM.

601 UNITED STATES PATENT OFFICE.

ROBERT A. HARRIS, of Philadelphia, Pennsylvania, assignor to himself and B. S. Harris, of same place.

Letters Patent No. 61734, dated February 5, 1867.

Improved Refrigerator.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Robert A. Harris, of Philadelphia, Pennsylvania, have invented an improvement in refrigerators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists of a refrigerator constructed in the peculiar manner, fully described hereafter, for the purpose of thoroughly chilling the air before it circulates through the several chambers, and in contact with the articles of diet contained therein.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation. On reference to the accompanying drawing, which forms part of this specification—

(Here follows diagram marked p. 600.)

Figure 1 is a vertical section of my improved refrigerator with the lid raised.

Figure 2 a transverse vertical section on the line 1–2 Fig 1.; and Figure 3 a front view with the lid closed.

Similar letters refer to similar parts throughout the several views.

The refrigerator consists, as usual, of a deep box, with front *a*, back *b*, ends *d d'*, and bottom *e*, made of two thicknesses of wood, with intervening air spaces; there being, in front, openings to which the double doors A are adapted, and the whole being supported on suitable legs *f f*. A lid, B, also made double, is hinged to the back *b*, and this lid, as well as the interior of the refrigerator, is lined, as usual, with thin zinc or galvanized iron. Within the box, near the upper end of same, is a chamber, D, for receiving the ice which rests on a grating, *h*, situated a short distance above the bottom, *i*, of the said chamber, in which a channel, *j*, is formed for a purpose described hereafter. A partition, *k*, extends from the under side of this channel to the bottom of the box, the latter being thus separated into two main compartments, E and F, across which extend any desired number of gratings, *m m*, for receiving the dishes or other vessels containing articles of diet. The two compartments E and F communicate with each other through holes, *p p*, in the par-

Defendants Exhibit Harris Patent 61,734 of 1867.
Hugh E. Wilson
Notary Public
Kent County
Mich.

No. 235
Belden Mfg. Co.
Challenge Com
Planer Co.
p. 600.

R. A. HARRIS.
Refrigerator.

No. 61,734.

Patented Feb. 5, 1867.

FILED
MAY 28 1890
C. L. Fitch
CLERK.

Fig. 1

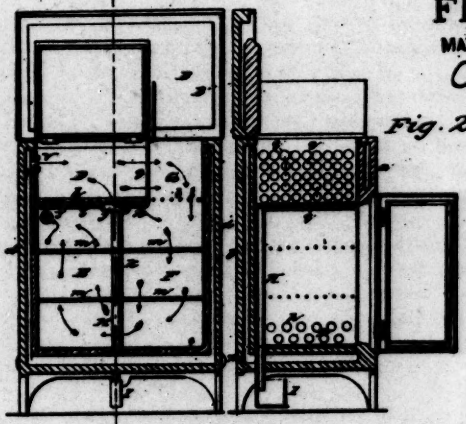
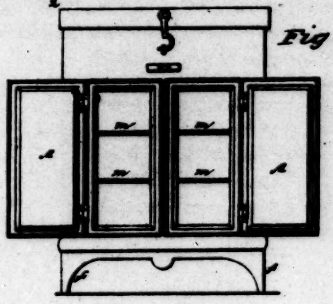


Fig. 2

Fig. 3



Witnesses:
[illegible]
John Parker.

Inventor:
R. A. Harris.
By his Atty
H. Flower

tition, *k*, near the bottom of the box; and the ice-chamber, D, communicates with the compartment F through a narrow opening at one end of the channel *j*. The end, *q*, of the ice-chamber D is perforated with a number of holes, so that the said chamber can communicate with a small compartment, G, having a grated bottom, *t*; this compartment being intended for the storage of butter, milk, &c. Air is admitted to the space between the two thicknesses of wood which compose the sides and ends of the box, at the point *x* (Fig. 2), or at any other point at or near the bottom of the box, the air passing upwards and through a valved opening, *v*, into the ice-chamber above the ice, through the body of which the air passes, in the direction of the arrows, through the opening *n*, into the compartment F, or through the perforations in the end, *q*, of the ice-box G, into the compartment F, through the gratings, *m*, of which the cold air passes to the bottom of the said compartment, and thence through the holes *p* in the partition *k*, into the compartment E, upwards through the latter, and through the gratings *m* in the same to the exit opening *y*. Whatever water drips from the ice finds its way into the channel *j*, and thence through the vertical pipe H into any suitable receptable, I, placed beneath the refrigerator. It will be seen that the air admitted from below must first pass through the mass of ice, and be thereby thoroughly chilled before it can circulate through the several compartments, in the direction pointed out by the arrows, and hence that the contents of the refrigerator must be maintained in the desired cool state. Whatever air passes through the narrow opening *n* into the compartment F, has first to pass through the ice, and then over the iced water in the channel *j*, and must be thoroughly chilled before it passes, in a thin stream, to the said compartment F. It is important that butter and milk should be maintained at the lowest temperature; hence the perforations in the end, *q*, of the ice-chamber, directly through which the frigid air passes on to the contents of the compartment G.

I claim as my invention, and desire to secure by letters patent—

The combination of the ice-chamber D, its opening *v*, and perforated end *q*; the compartments G and F, the channel *j*, at the bottom of the ice-chamber, and the opening *n*; the whole being arranged as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

R. A. HARRIS.

Witnesses:
C. B. PRICE.
JOHN WHITE.

602 DEFENDANT'S EXHIBIT LITTLE PATENT, 129,671 OF 1872. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

604 UNITED STATES PATENT OFFICE.

HENRY D. LITTLE, of Rockford, Illinois.

Improvement in Refrigerators.

Specification forming part of Letters Patent No. 129,671, dated July 23, 1872.

I, Henry D. Little, of Rockford, in the county of Winnebago, in the State of Illinois, have made certain improvements in refrigerators, of which the following is a specification:

(Here follows diagram marked p. 603.)

In the drawing, figure 1 is an upright sectional view of the refrigerator, and Fig. 2 is a horizontal sectional view on the line of the under side of the cover.

The invention consists in the construction and arrangement of the ice-chamber with relation to other parts of the refrigerator, whereby greater refrigerating influences are obtained, as will be fully hereinafter described.

A is the outside case of the refrigerator, and A′ is the lid upon the top of the refrigerator, and opening into the ice-chamber. B is the triangular ice chamber or box, and at its top covers the entire top surface of the inner chamber, and has inclined sides *b b* extending from the point of connection at the top of the chamber with the inner walls B′ of the refrigerator to the point at which the inclined sides meet at the bottom, where the frame-support of the sides meet together; but the sides themselves do not meet, but are cut short, and form an opening for the water that is produced from the melting of the ice to escape and fall into a receiving-trough, C, that is directly under the drip of the ice-chamber, and extends from the front transversely across the inside of the refrigerator to the rear side, where the flow of water is led off by the waste or drain pipe *c*, and through to the bottom, to fall into any vessel placed underneath it. *b′* is an open grate for the support of the ice at the lower point of the ice-chamber, and through and at each side of which the water from the melted ice can freely escape into the trough C. *d d* are the shelves in the cool-chamber underneath the ice-chamber, and supported in the usual manner. *e* is a ventilator-aperture for the purpose of allowing the heated or warm air to escape, of which there may be one or more on each side of the ice-chamber and near the top of the cooling-chamber.

The advantage gained by this particular form of ice-chamber can be readily seen, as it covers the entire top of the interior chamber,

H. D. LITTLE.

Improvement in Refrigerators.

No. 129,671. **Patented July 23, 1872.**

Fig. 1.

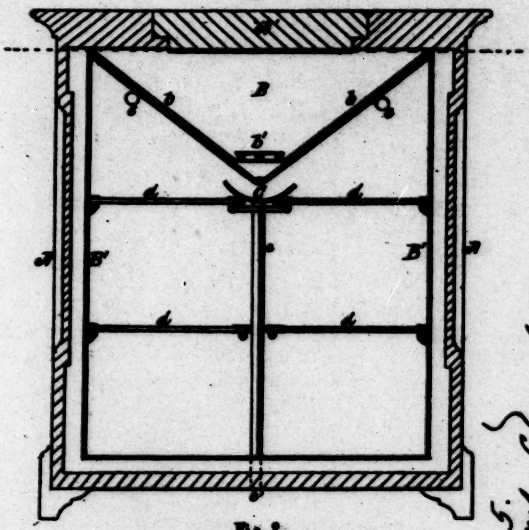
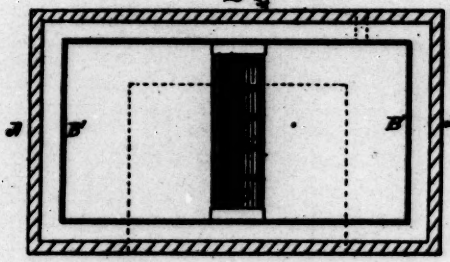


Fig. 2.



No. 235.
Belden Mfg. Co
" Challenge Corn
Planter Co
p. 603

Witnesses:

Jonas Hall
H. A. Daniels

Inventor:

Henry D. Little
By N. Crawford
atty.

and has sloping sides which facilitate the keeping the ice as it melts in a compact state. All the water can freely drip from the melting ice, and the warm air is free to escape through the ventilator-holes *e*, as the outwardly-sloping sides of the ice-chamber have the effect to conduct the warm air to the place for its escape from the cool-chamber.

Having fully described my invention, what I claim, and desire to secure by letters patent, is—

The improved refrigerator, having the triangular-formed ice-chamber B, covering the entire top of the cooling-chamber, grate *b'*, water-trough C, drain-pipe *c*, and ventilator-holes *e*, constructed and arranged in the manner and for the purpose substantially as described.

HENRY D. LITTLE.

Witnesses:

NEWTON CRAWFORD.

H. A. DANIELS.

606 UNITED STATES PATENT OFFICE.

A. J. CHASE, of Boston, Massachusetts, assignor to B. F. Horn, of same place.

Letters Patent No. 95428, dated October 5, 1869.

Improved Refrigerator.

The schedule referred to in these letters patent and making part of the same.

To all to whom these presents shall come:

Be it known that I, A. J. Chase, of Boston, in the county of Suffolk, and Commonwealth of Massachusetts, have made an invention of certain new and useful improvements in air-refrigerating chambers or chests for slaughter-houses, markets, &c.; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawings, making part of this specification, and in which—

(Here follows diagram marked p. 605.)

Figures 1 and 2 are respectively longitudinal and transverse-vertical sections of a refrigerating-apparatus embodying my invention.

I would preface the description herein to follow of my invention, by the remark that I am, of course, well aware that it is no new thing to effect the ventilation or purification of the interior of a refrigerator by the admission thereto of external atmospheric air, and so far as my knowledge extends, which my business of manufacturing refrigerators, as well as extended and careful trials, as a matter of necessity have rendered comprehensive, all experiments to this end have been conducted upon the supposition that to thoroughly ventilate the interior of a refrigerator, the presence of atmospheric air in large quantities therein was necessary.

Numerous and elaborate experiments have demonstrated to me the fallacy of this theory, and my present invention has rather to do with an air-tight refrigerator, so to speak, or one in which practically no atmospheric air is admitted, or only that effecting an entrance at short clandestine intervals of time, such as opening the door or cover of the device affords.

My present invention, then, may be said to constitute a self-ventilating, practically air-tight refrigerator, since it does not depend for success, in any material degree, upon the presence of atmospheric air in material quantities.

In carrying out the invention herein described, and which constitute the subject-matter of these letters patent, I provide a case, box, or structure, A, of wood, or other suitable material, and I construct such object with double walls, and fill the intervening spaces with any proper non-conducting material, after the manner of a majority of refrigerators now in use.

Defendants' Exhibit Chase Patent 95,428 of 1869
Hugh E. Wilson
Notary Public.
Kent County
Mich.

A. J. Chase.

Refrigerator.

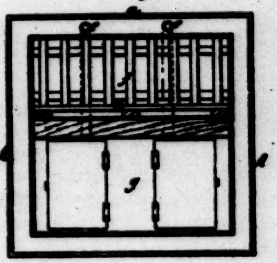
No. 95,428. Patented Oct. 5, 1869.

No. 235.
Bel dew Mfg Co
Challenge Con
Plaster Co
p. 605

FILED
MAY 28 1890
C. L. Fitch
CLERK.

Fig. 2.

Fig. 1.



Witnesses,
Edward Griffith.
Geo. A. Loring.

Inventor,
A. J. Chase
by his Attorney
Federal Curtis.

The upper portion *a* of the structure A is, preferably, contracted in size, and separated from the lower by a floor, *b*, provided with a suitable rack, *c*, for supporting the ice, and also with a discharge-pipe, *d*, for carrying off tainted ice-meltings, and with apertures *h*, for the descent of the cold air.

In pursuance of the principles of my invention, I dispose, preferably within the hollow walls of the structure, and surrounded by its non-conducting material, one or more tubes or air-conduits *e e*, &c., one extremity of such conduit opening into the upper part of the ice-chamber *f*, and the opposite and lower extremity into the upper part of the provision-chamber *g*, as represented in Fig. 2 of the drawings, by which means free communication is offered between the two. The non-conducting material employed for filling the walls of the structure isolates the air-conduits from the influence of the ice within the ice-chamber.

The above description embraces the mechanical construction and organization of my invention, and, though brief, will be amply sufficient, with the aid of the annexed drawing, to enable mechanics of fair acquirements to manufacture the invention, the operation of the device being as follows:

The cold air, produced by the presence of the ice in the chamber *f*, falls, by natural laws, to the warmer provision-chamber below, by this creating or tending to create a vacuum above the ice, which must be supplied from some source, as well as exerting a weight, mechanically speaking, upon the air in the chamber below.

The weight, as well as the tendency to a vacuum, drives the air from the remotest part of the chamber *g*, where it naturally collects, through the conduits *e e*, and into the upper part of the ice-chamber, and is precipitated upon the ice therein, this passage or flowage of air through the apparatus becoming afterward self-continued and regular.

The air, in its passage through the provision-chamber, becomes charged and impregnated with the odors from the provisions contained therein.

It is well known that objects of a low degree of temperature possess a great affinity for warm odors or vapors, exhaled from animal or vegetable matter; consequently, the ice in the ice-chamber possesses a great attraction for the warm odors and animal heat escaping from the contents of the provision chamber.

These odors strike against and circulate about the ice, and, while tending to melt the latter, are seized by and incorporated with the water resulting from the melting of the ice, and escape with it from the apparatus, through the waste-pipe *d*.

It will be seen, that while a small quantity of air is evolved within the ice-chamber, by the melting and partial evaporation of the ice therein, and a small quantity is also admitted to the provision-chamber by the insertion or removal of provisions, my refrigerator may, notwithstanding, be considered practically an air-tight one, inasmuch as the air gaining access to its interior is infinitessimal in comparison with those admitting and discharging external air directly, as a systematized process of ventilation.

Owing to the exclusion of any great amount of external air from the interior of the structure, the wasting of the ice is very slow, a great economy in this respect being effected in comparison with refrigerators through which a current of such air circulates.

607 Having thus described the nature and operation of my invention,

What I believe to be novel and original with myself, and desire to secure by letters patent of the United States is as follows:

Claim.

An "air-tight" refrigerator, so called, composed of the two chambers *f g*, separated by the partition *b*, and communicating with each other through the cold-air aperture *h*, and the conduit *e* for the ascent of the warm air, the latter passing up through the non-conducting material which forms the walls of the refrigerator, and the whole being arranged for joint operation, as herein shown and described.

A. J. CHASE.

Witnesses:
FRED. CURTIS.
EDWARD GRIFFITH.

A. KOCH.

Refrigerator.

No. 77,624. Patented May 5, 1868.

Fig. 1.

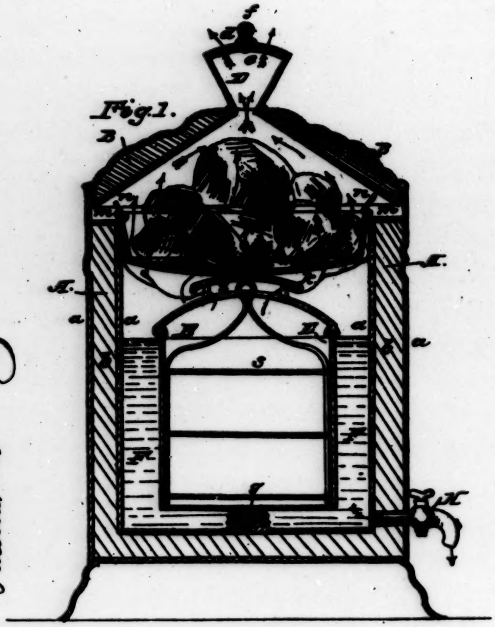
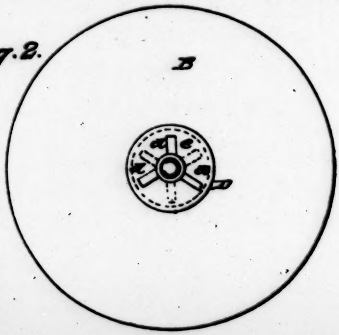


Fig. 2.



Mo. 235.
Belden Mfg. Co.
v.
Challenge Corn
Planter Co.
p. 609

WITNESSES:
R. H. Young
T. W. Stumph

INVENTOR.
August Koch
Per
David A. Burr
atty.

608 DEFENDANT'S EXHIBIT KOCH PATENT, 77624 OF 1868. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

610 UNITED STATES PATENT OFFICE.

AUGUST KOCH, of Baltimore, Maryland.

Letters Patent No. 77624, dated May 5, 1868.

Improved Cooler and Refrigerator.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, August Koch, of the city and county of Baltimore, in the State of Maryland, have invented a new and improved water-cooler and refrigerator; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

(Here follows diagram marked p. 609.)

Figure 1 is a central vertical section through my improved cooler, and

Figure 2 is a plan of the top thereof.

Similar letters indicate like parts in each of the figures.

The nature of my invention consists in the combination of a perforated detachable ice-pan, placed in the upper part of a water-cooler, with a ventilated cover for the cooler, a refrigerating-box placed within the same beneath the ice-pan, and a water-space surrounding said box, so that the cold water dripping from the ice shall fall into and cool the water in the water-space, and the air cooled by the ice descend upon the water and into the refrigerating-box, whilst the impure and warmer air from the box, and from the water surrounding it, may freely escape, keeping the whole apparatus and its contents sweet and pure at a very low temperature.

The outer walls A of my water-cooler may be made in the usual manner, of an inner and outer shell, *a* and *a'*, separated by a lining, *h*, of charcoal or other good non-conducting material.

The cover B is similarly made and lined; but I make the knob D, forming a handle to lift the same, hollow and provide it with apertures *d d d*, (see Fig. 2,) opening outwardly, and closed at pleasure by a slotted plate, *e*, Fig. 1, pivoted on the inner side of the top of the knob. This plate is secured to a button, *f*, whereby it may be turned so as to cover or uncover, and thus open or close the apertures *d*.

Centrally, within the cooler, is placed a metallic vessel or box, E, which is made so much smaller in section or diameter than the

inner diameter of the cooler as that a water-space, F, shall be left between the two. This inner vessel rests upon a support, G, projecting centrally from the bottom of the cooler, so that the water-space F extends beneath, as well as around, the vessel E. A threaded collar, *g*, is secured outwardly upon the bottom of the vessel E, to screw either upon or into the support G, and thus fasten said vessel in place; or the support may be made hollow, to receive a pin projecting from the vessel for the same purpose.

An outer spigot, H, extends to and communicates with the space F, to permit water to be drawn therefrom at pleasure. The lid or cover of the vessel or box E is pierced centrally with a ventilating-aperture, *i*, over which is placed a cap, *k*, completely covering the same, but so elevated therefrom as to allow a free circulation of air beneath it, through the aperture *i*. Within the box E, I contemplate placing a detachable rack, S, having one or more perforated shelves or wire frames, upon which to place butter and other articles to be preserved and cooled therein. The vessel E is so proportioned in height as to leave a space between its cover and the top of the cooler to receive a perforated ice-pan, L, whose rim *m* is made to rest upon the upper inner edge of the cooler, and be supported thereby within the cooler, the depth of the pan being such as that its bottom will barely touch the top of the cover of the vessel E beneath. Rings *n n* are secured to the rim *m*, for lifting and removing the pan L.

In using my improved cooler, the vessel E, being first secured in place within the same, I fill the surrounding space, F, with water, up nearly to the top of said vessel, within which I place, by means of the rack S, butter, meats, or other articles to be kept cool. Having then covered this vessel with its ventilating-cover, I place the ice-pan L, filled with ice, in the top of the cooler, and then cover the cooler with its cover B. The ice-water and cold air descending from the ice will rapidly cool the water and the vessel E and its contents, whilst the warmer air therefrom will rise through the ventilating apertures as fast as it is displaced by the cold air from the ice. The cap *k* prevents the entrance of the dripping ice-water into the vessel E, and yet allows a free ventilation thereof. The ice-pan, when filled, may be readily removed, without disturbing the ice, by means of its rings *n n*, and the contents of the inner vessel or box, E, be thus reached without difficulty.

Having thus fully described my invention, what I claim therein as new, and desire to secure by letters patent, is—

611 The combination of a detachable sieve or perforated ice-pan, L, with the upper part of a ventilated water-cooler, A, and with a ventilated refrigerating-box or vessel, E, placed centrally therein beneath said pan, and surrounded by a water-space, F, all substantially as and for the purpose herein set forth.

The foregoing specification of my improved water-cooler and refrigerator signed by me, this ninth day of April, A. D. 1868.

AUGUST KOCH.

Witnesses:

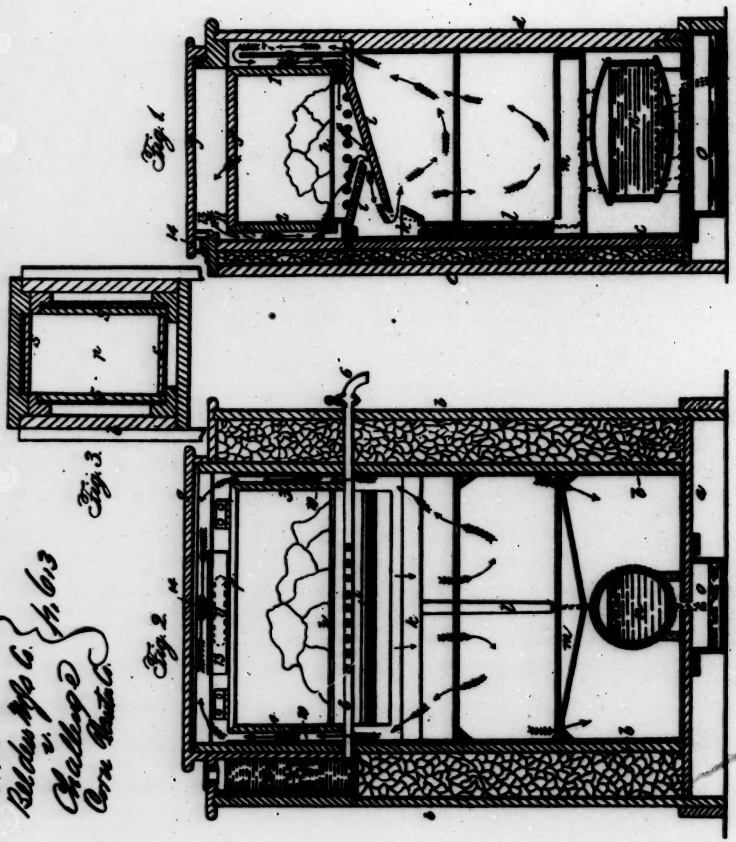
DAVID A. BURR.

H. H. YOUNG.

G. A. BANTA.

Refrigerator.

No. 60,665. Patented Jan. 1, 1867.



No. 235.
Belden Mfg Co.
v.
Challenge
Corn Planter Co.
h. 613

Witnesses:

Chas H Smith
G. Dennett Warder

Inventor:

George H. Banta

612 DEFENDANT'S EXHIBIT BANTA PATENT, 60665 OF 1867. Hugh E. Wilson, Notary Public, Kent County, Mich. Filed May 28, 1890. C. L. Fitch, Clerk.

614 UNITED STATES PATENT OFFICE.

GEORGE A. BANTA, of New York, N. Y.

Improvement in Refrigerator.

Specification forming part of Letters Patent No. 60665, dated January 1, 1867.

To all whom it may concern:

Be it known that I, George A. Banta, of the city and State of New York, have invented, made, and applied to use a certain new and useful improvement in refrigerators; and I do hereby declare the following to be a full, clear, and exact description of my said invention, reference being had to the annexed drawing, making part of this specification, wherein—

(Here follows diagram marked p. 613.)

Figure 1 is a vertical section of the said refrigerator transversely. Fig. 2 is a vertical section at right angles to Fig. 1, and Fig. 3 is a section of the water-cooler detached.

Similar marks of reference denote the same parts.

Refrigerators have heretofore been made with wooden and metal lined ice-boxes, and slate has been employed as a lining for the refrigerator-case.

In all the refrigerators heretofore constructed the box holding the ice and forming a separate chamber in the refrigerator is liable to become foul from the accumulation of dirt and straw, which so often adheres to the ice, and in the wooden ice-boxes the water is absorbed, and the wood becomes saturated; and this is often the case in metal-lined ice-boxes, because that metal is often destroyed by the action of the moisture, or perforated by the ice-picks used in breaking the ice.

The nature of my said invention consists in an ice-box for a circulating refrigerator formed with slate sides or bottom, or both, so that the same may be kept clean much more easily, and not be liable to corrosion by the moisture or vapors, or to injury by the ice-pick, and I arrange the air-passages so that the air shall circulate through the refrigerator and pass away, or simply rotate around in the refrigerator; and I make use of the water passing off from the melting ice to cool a barrel or other vessel placed within the refrigerator containing beer or other liquid.

In the drawing, *a* is the bottom; *b*, the sides; *c*, the back, and *d* the door or doors of the refrigerator, formed in any usual or desired manner, and lined with metal or other material, and either filled

with a non-conducting material between the exterior and interior casing, or having air-spaces in any usual manner.

e is the ice-box formed with slate front and back 1 2, and sides 3 4. *f* is the cover for the ice-box, and *g* is the cover for the refrigerator. *h* is a grating or movable slats upon which the ice rests. *i* is the slate bottom for the refrigerator conveying the water melting from the ice to the trough *k*, whence a pipe, *l*, carries the water to a pan, *m*, in the bottom of which are holes that cause the cold water to flow over a barrel containing beer or other liquid placed below said row of holes. This cold water trickling over the barrel *n* cools its contents much more effectually than would be the case were the cask only exposed to the cooling action of the air in the refrigerator.

The ice, as it melts, passes away in the form of water at a low temperature, and, in running over the vessel *n*, the water is made warmer by the heat absorbed, and at the same time the refrigerator is cooled by the extent of moist surface of said vessel exposed to the air within the refrigerator; thereby the cooling power of the ice is all availed of, the water passing out of the refrigerator at nearly the same temperature as the air that is within the refrigerator, and the contents of the vessel *n* are equally cooled.

The water is received into a water-tight drawer, *o*, which slides into the base of the refrigerator, and is much more convenient for the reception of the water than the separate pans heretofore usually employed.

p is a water-cooler formed of slates set into the refrigerator adjoining the ice-box, and cemented to place, so as to be water-tight.

The mode of constructing this cooler is more clearly shown in Fig. 3, wherein the slate lining *s* is set into a frame, and the exterior of the slates is covered with pasteboard or straw-board cemented on by india-rubber or equivalent water-proof cement. From this cooler *p* a pipe, 5, passes to the faucet 6. I prefer that the said pipe 5 should be coiled beneath the grating *h*. This slate water-cooler can be made much more conveniently, and is more durable and cleanly than the water-coolers heretofore employed. The pipe 5, being below the rack or grating, is kept cool by the circulation of air and by the dripping water, and the ice is not melted as it would be by direct contact with the pipe.

615 The warmer air in the front part of the refrigerator ascends through the space 7, and then passes down in the space 8 between the division 9 and the front of the ice-box into the ice-chamber across below the ice where any vapors held in suspension are condensed and pass away with the water. Thence the air descends, being cooled, in contact with the slate bottom and back again into the refrigerator, thus rotating and cooling the refrigerator.

The air at the sides of the refrigerator passes up the spaces 10, across over the cover *f* of the ice-box, down through the opening 11 and space 12 into the ice-box, and the division *i* causes the air to pass across below the ice and commingle with the current before described; but, if it is desired to circulate the current of air so that it will pass out of the refrigerator for ventilation or otherwise, a

swinging valve, 13, is moved to cover up the opening 11, and uncover an opening, 14, through the main cover.

What I claim, and desire to secure by letters patent, is—

1. In an ice-box for a refrigerator lined with slate, in combination with air-passages surrounding said ice-box, through which air circulates to and from the refrigerator, and is cooled by contact with the exterior of such slate ice-box, substantially as specified.

2. In a refrigerator, the perforated trough *m* receiving the water that comes from the ice-box, and delivering it through a series of small holes, so as to flow over the outside of a barrel or other vessel for cooling its liquid contents, as set forth.

3. A receptacle for water in a refrigerator formed of slates in the manner specified, so that the water shall be cooled by the air circulating in contact with its exterior surface, as set forth.

4. The ascending air-passage 7 and descending passage 8, in combination with the ascending air-passages 10 and descending passage 12, whereby the air is caused to travel around the ice-box in passing to and from the chamber of the refrigerator, as set forth.

5. The valve 13, in combination with the air-passages 11 and 14, whereby said valve can be employed for closing the passage 11 for ventilating the refrigerator, or opening it for effecting a circulation of the air, as set forth.

Dated this 19th day of April, A. D. 1866.

GEORGE A. BANTA.

Witnesses:
GEO. D. WALKER.
CHAS. H. SMITH.

616 In the United States Supreme Court.

THE BELDING MANUFACTURING COMPANY, Appellant,
vs.
CHALLENGE CORN PLANTER COMPANY, Appellee.
} In Equity. No. 235. Oct. Term, 1893.

Stipulation.

At the request *for* counsel for appellant and in order to reduce the cost of printing the record herein it is hereby stipulated by and between the counsel for the respective parties to the above-entitled cause that the clerk of the Supreme Court of the United States may omit from said printed record the following exhibits, to wit:

1. Complainant's Exhibit Incorporation Hambrook Co.
2. Complainant's Exhibit Hambrook Assignment.
3. Complainant's Exhibit Certificate of Change of Corporate Name.
4. Complainant's Exhibit Booth & Osgood Suit Records.
5. Complainant's Exhibit Stanton Assignment.
6. Complainant's Exhibit Vail Assignment.
7. Complainant's Exhibit Belding Assignment.
8. Complainant's Exhibit Belding 1889 Catalogue.

9. Complainant's Exhibit Defendant's 1889 Catalogue.
10. Complainant's Exhibit Complainant's Notice of Infringement.
11. Complainant's Exhibit Defendant's Letter.
12. Complainant's Exhibit Belding 1885 Catalogue.
617 13. Complainant's Exhibit Belding 1886 Catalogue.
14. Complainant's Exhibit Belding 1887 Catalogue.
15. Complainant's Exhibit Schofield Shipping Receipt.
16. Complainant's Exhibit Booth & Osgood 1884 Catalogue.
17. Complainant's Exhibit Defendant's 1887 Catalogue.
18. Complainant's Exhibit Page 22 Belding 1885 Cash Book.
19. Complainant's Exhibit Booth & Osgood 1883 Catalogue.
20. Complainant's Exhibit Spear & Converse Contract.
21. Complainant's Exhibit Gardner Memorandum Book.
22. Complainant's Exhibit Gardner's Memorandum, pages 1, 2, and 3.
23. Defendant's Exhibit Invoices Refrigerators Purchased of the Belding Co., sheets 1 to 25, both inclusive.
24. Defendant's Exhibit Catalogue 1889 Simmons Hardware Co.
25. Defendant's Exhibit Catalogue 1889 Belding M'f'g Co.
26. Defendant's Exhibit Buhl, Sons & Company's Contract.
27. Defendant's Exhibit Buhl, Son's & Company's Circular.
28. Defendant's Exhibit Leonard Catalogue.
29. Defendant's Exhibit Alaska Catalogue.
30. Defendant's Exhibit Baldwin Catalogue.
31. Defendant's Exhibit Iceberg Chief Catalogue.
32. Defendant's Exhibit Joseph W. Wayne Catalogue.
33. Defendant's Exhibit John C. Jewett Catalogue.
34. Defendant's Exhibit Belding Co. Letter of Mar. 15, 1889, to Foster, Stevens & Co.
35. Defendant's Exhibit Francis T. Witte Hardware Co. Letter.
618 36. Defendant's Exhibit Francis T. Witte Hardware Co. Letter No. 2.

Signed at Chicago, Illinois, this first day of September, A. D. 1893.

TAYLOR E. BROWN,
Solicitor for Appellant.

Signed at Grand Rapids, Michigan, this 2nd day of September, A. D. 1893.

EDWARD TAGGART,
Solicitor for Appellee.

619 [Endorsed:] Case No. 14,244. Supreme Court U. S., October term, 1893. Term No., 235. The Belden M'f'g Co., appellant, *vs.* The Challenge Corn Planter Co. Stipulation to omit parts of record in printing. Filed September 7, 1893.

Endorsed on cover: Case No. 14,244. W. Michigan C. C. U. S. No. 235. The Belden Manufacturing Company, appellant, *vs.* The Challenge Corn Planter Company. Filed October 11, 1890.

Supreme Court, U.S.
FILED
JAN 13 1894
JAMES H. McKENNEY,
CLERK

IN THE

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, A. D. 1893.

No. 235.

THE BELDING MANUFACTURING COMPANY,
Appellant,

vs.

THE CHALLENGE CORN PLANTER COMPANY,
Appellee.

Appeal from the Circuit Court of the United States for the Western District of Michigan.

BRIEF ON BEHALF OF APPELLANT.

TAYLOR EVERETT BROWN,
CHARLES CLARENCE POOLE,
OF COUNSEL.

BARNARD & GUNTHORP, PRINTERS, CHICAGO

IN THE

Supreme Court of the United States.

OCTOBER TERM, A. D. 1893.

No. 235.

THE BELDING MANUFACTURING COMPANY,
Appellant,

vs.

THE CHALLENGE CORN PLANTER COMPANY,
Appellee.

Appeal from the Circuit Court of the United States for the Western District of Michigan.

STATEMENT OF THE CASE.

I.

This is an appeal from a decree in equity made by his Honor Judge SEVERENS, on the 25th day of June, 1890, dismissing appellant's bill on the ground that the letters patent sued upon were invalid. (Rec., 9.)

The bill charged the defendant below with having infringed the claim of Letters Patent of the United States No. 204,216, granted on the 28th day of May, 1878, to Richard T. Hambrook for an improvement in refrigerators (Rec., 27), the entire ownership being in the appellant, by proper assignments. (Rec., 33, 34.)

The word refrigerator as used in this record refers solely to that class of refrigerators of relatively cheap and portable construction used for domestic or household purposes, as distinguished from refrigerators generally, such as refrigerator rooms, cars, houses and the like.

"Complainant's Exhibits, Defendant's Refrigerators No. "1," and "Complainant's Exhibits, Defendant's Refriger- "ators No. 2," represent the appellee's construction (Stipulation, Rec., 55), alleged to contain the invention, and to be an infringement of the Hambrook patent.

The decree found the Hambrook letters patent to "contain and set forth no patentable invention in view of "preceding inventions and the prior state of the art." (Rec., 9.)

THE DEFENSES,

set up by the pleadings, may be stated in the following order:

1. Non-infringement.

2. Complainant's patent is invalid:

(*a.*) By the showing of the prior art.

(*b.*) For lack of patentable novelty.

(*c.*) Because the invention was abandoned to the public by Hambrook or his assignees after the patent was issued.

3. There should be no recovery because complainant failed to mark its refrigerators "Patented" until after defendant began to infringe.

The only defense considered by the court below was that of non-invention, and on this the court below based its opinion. (Rec., 10.)

It must be stated that there was a cross-bill filed by the defendant below, that was dismissed by the court but no appeal has been taken therefrom. (Rec., 10.)

THE TESTIMONY

on behalf of complainant below consists, in part, of the introduction of its title papers, and of the letters patent sued upon, of a refrigerator exhibit embodying the invention set forth in the patent, and two refrigerator exhibits, the manufacture of the defendant below, as well as a number of exhibit catalogues.

The appellant has also produced the testimony of several witnesses, Stanton, Belding, Cutler, Nye, Gould, Ranney, Marshall, Felix and Lewis, who testified to the superior merit, value and utility of household refrigerators embodying the Hambrook invention and their success upon the market, and their evidence was strongly supplemented by that of the two mechanical experts Melville E. Dayton and R. D. O. Smith. The other witnesses were called mainly to testify regarding questions of fact.

The testimony on behalf of defendant below consists of the introduction of a number of prior alleged anticipating patents, of a number of exhibits, including refrigerators, catalogues and copies of Patent Office models, and of the testimony of a mechanical expert, Mr. J. W. See. In an attempt to lessen the recovery against it, the appellee has also taken the depositions of a number of witnesses to prove that prior to the fall of 1885, complainant did not mark its refrigerators "patented" as required by law.

Complainant's rebuttal testimony fully justifies its acts of omission (if any) and completely overcomes the de-

fenses attempted. It consists mainly of the expert depositions of Mr. Dayton and Mr. Smith, each of whom considered in detail the several prior patents relied upon to anticipate the Hambrook patent.

The record discloses the fact that the patentee, or the R. T. Hambrook Manufacturing Company, manufactured and sold a large quantity (something over 6,000) of domestic refrigerators embodying his invention. The corporate name was changed to the Booth and Osgood Manufacturing Company, and later on the company went into the hands of a receiver. This officer soon closed out or sold the school furniture part of the business and continued the manufacture and sale of the Hambrook refrigerator, which was known to the trade as the "Perfection." The receiver disposed of about 4,000 refrigerators prior to the sale of the business to the Belding Manufacturing Company, the appellant. The 10,000 Hambrook refrigerators thus sold gave entire satisfaction, and the record disclosed that only five (5) were complained of and returned to the factory.

The Belding company's refrigerators were called the "New Perfection" refrigerators, and are so known in the trade to-day. They differ in minor details from the construction of the "Perfection" refrigerator, which followed closely the construction illustrated in the Hambrook patent drawings. Those differences (which will be hereafter referred to) did not change the character of the icebox, nor modify the principle of operation, but were mechanical changes tending to cheapen the cost of manufacture, to strengthen the construction and add to the outward appearance of the refrigerator. The evidence conclusively shows, as appellant contends, that, these changes being purely formal, the New Perfection refrigerator embodies the invention of the patent in suit.

The appellees' refrigerator is known as the "Challenge Iceberg" and is an exact duplicate, so far as interior arrangement, principle of operation and external appearance are concerned, of the "New Perfection" refrigerator of the appellant. The act of infringement was premeditated and deliberate. There was no attempt to vary the details of construction to possibly avoid the patent, but on the contrary it was the express intention to copy and duplicate the New Perfection refrigerator.

The record shows that appellant began the manufacture of refrigerators in the fall of 1884, as the successor of the Hambrook Manufacturing Company and the Booth and Osgood Company. In the fall of 1885, when its works at Belding, Michigan, were temporarily closed for repairs, the appellee sent its manager and superintendent, Levi C. Schofield, to make a minute inspection of the works of the Belding Company, stock on hand, tools and machinery. In November, 1885, this man Schofield paid a second visit to the Belding factory and made another tour of inspection of the shops, being shown courteously through the place by the unsuspecting officers of the appellant. Schofield purchased a refrigerator of the appellant, and had it shipped to his home at Grand Haven, Michigan. Upon cross-examination, he was forced to admit that he had taken this refrigerator apart and minutely examined it for the purpose of taking sizes and measurements. (Record pages 300, 301 and 302.)

He also testified on cross-examination that the appellant decided to begin the manufacture of refrigerators some time in the fall of 1885, but that it did not complete any ice-boxes or put the same upon the market until after the 1st of January, 1886, and that *prior* to engaging in the manufacture of refrigerators and under

the instruction of his company, he had made an exhaustive personal investigation in the United States Patent Office at Washington of the art of refrigerators, that he personally examined all of the United States and foreign patents then issued, and that he had examined, among others, this very patent to Hambrook upon which the complainant has brought this suit.

The identity of Complainant's Exhibit Defendant's Refrigerator, with Complainant's Exhibit Complainant's Refrigerator cannot be seriously questioned by the appellee. (Record Q. 8, page 40.) It will contend that the differences in construction between its refrigerator and the construction called for by the claim are vital and sufficient to avoid an infringement of the Hambrook patent.

Having informed the court of the nature of the controversy and of the testimony introduced upon the part of each litigant, it is now in order to refer to the patent itself.

The subject-matter of the Hambrook Patent No. 204,216, is that of a refrigerator for domestic or household purposes, and is described in the second paragraph of the patent, as follows:

"The nature of my invention consists in the construction of a refrigerator having an ice-chamber constructed in such manner that air will impinge upon the top, bottom and sides of the ice, and that the continuous volume of cold air generated by the melting of the ice will descend in a dry state to the provision-chamber without *material hindrance*, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side therefore without meeting the descending current of cold air."

To more clearly understand the improvement which Hambrook produced and patented, and before considering the details of his patent, we shall briefly refer to

The Prior Art.

We shall endeavor to ascertain just what had been done and what had been left undone in order to better determine Hambrook's place in the line of improvement.

Prior to Hambrook's invention, the general facts connected with refrigerators such as the idea that cold air is heavier than warm air, and will fall by its greater specific gravity, and that the warm air which it displaces will consequently rise, had long been known. Hambrook's patent was not broadly to cover this well known physical fact, nor was it for the general location of an ice-chamber above a provision-chamber communicating with the latter, by which the difference in specific gravity between the cold and warm air will produce a circulation within the box, nor was it for any particular form of ice support, nor was it for water passages or troughs by which the drip from the ice was carried away, nor was it for the passage by which the air could descend into or ascend from the provision-chamber. Many prior patents had been issued on refrigerators illustrating some of the objects of the Hambrook patent, but no prior patentee, however, seems to have attained all the desirable results or shows a construction in a portable, domestic refrigerator capable of in any manner accomplishing the superior results in refrigeration achieved by Hambrook, or having the commercial advantages of the latter.

One important fact is to be noted in regard to the state of the prior art as represented by the patents cited, viz.: that two methods of circulation have been employed. In one group of prior patents each refrigerator shows openings in the refrigerator for establishing com-

munication between the inner and the outer air, the other group illustrating refrigerators having no communication with the outer air. That is to say, in one class the air within the refrigerator is designed to be refrigerated by contact with the ice, sent to the provision chamber, there to be warmed and then again brought into contact with the ice and so on, continuously using the same air over and over again, save that which incidently escapes or is admitted when the doors are opened for any purpose. It is to this class that the Hambrook patent belongs. In the other class, the air is designed to be admitted into the refrigerator, passed to the ice and refrigerated thereby, then sent to the provision chamber and finally directed out of the box, thus really passing a current of air *through* the box. As different conditions are at work on all ice-boxes in this latter class, it is contended in view of the essential difference in principle of operation between the two classes, that no prior patent belonging to this second class can be fairly said to anticipate Hambrook.

A second fact must not escape attention, to wit: that neither of these two classes antedates the other as a class in the art. The history of the art shows that one inventor adopts class one, another class two, and a later inventor returns to class one. There seems to have been no general adoption of the one or the other systems of air circulation for any considerable period.

In one group we find the find the following patents: Yost, 1859; Banta, 1867; Harris, 1867; Koch, 1868; Rohrer, 1871; Little, 1872; and Page, 1876, and it is urged that they can have no proper application to the issues here involved because they depend upon the admission of atmospheric air for a constant circulation,

and therefore embody an entirely different principle of operatiou from that of the Hambrook patent. This proposition is fully admitted by the appellee's expert witness, J. W. See. (Record, p. 288, C. Q. 14, 15 and 16.)

In the second group we find the following patents cited, viz.: Sanford, 1855 and its re-issue of 1857; Lyman, 1856; Law, 1867; Chase, 1869; Hunt, 1870 and its re-issue of 1872; Butler, 1875; and Smith, 1877 and its re-issue of 1878. We will take these patents up in the order in which they were issued from the Patent Office.

The Sanford patent of 1855 is the earliest here shown. The construction provides for the location of the ice at the top of the box and the provisions below, and it is expected that the air will be refrigerated by the ice, descend upon the provisions, be warmed, and then return to the ice. The ice closes the opening through which air is supposed to pass; a funnel below the central opening obstructs the free downward passage of cold air and the shelves in the provision chamber are alternately provided with air passages at their right and left-hand ends to cause the current of cold air to take a zigzag course. The peculiarities of the Sanford construction are such as to make it impossible to produce the descried results, the evident desire of the inventor being to provide as many obstructions as possible to the feeble air current, and he certainly succeeded to a marked degree. These obstructions, in view of the light afforded by the Hambrook patent, are shown in the record to be fatal defects.

The next patentee was Lyman, whose invention was intended to be applied to the cooling of rooms. The main feature of his device was a method for cooling and venti-

lating rooms, carried out by the construction shown in his drawings. He states in his specification: "My im-"provement in cooling, drying and disinfecting consists "in the peculiar construction of the box or reservoir for "holding the ice or other cooling material. The object "sought to be accomplished by this construction is the "production of a blast or current of cool air in a deter-"mined direction without mechanical aid and irrespective "of place." To this end he shows a box provided with ice at one of its upper corners and having a funnel or tube leading from the bottom of the ice compartment to the extreme bottom of the box or room. The principle employed is the same as that of Sanford and it will be seen hereafter that the invention of Hambrook finds no parallel in anything shown or described either by Lyman or Sanford.

The patent to Law of 1867, states:

"My invention has for its object to so improve the construction of refrigerators that the bottom of the ice-chambers may not be liable to injury by an accidental blow of the ice-pick; and it (the invention), *consists in forming the bottom of the ice chamber of corrugated cast-iron, and in forming the bottom of said ice-chamber double.*"

The Banta patent of 1867 illustrates a roundabout course for the air currents and provides for the exit of the heated air to the outside of the box as well as the return of the heated air to a space below the ice-chamber. The inventor says that his invention consists "in an ice-box "for a circulating refrigerator formed *with slate sides or* "*bottom or both*, so that the same may be kept clean "much more easily, and not be liable to corrosion by the "moisture or vapors, or to injury by the ice-pick, and I "arrange the air passages so that the air shall circulate "through the refrigerator and pass away, or simply "rotate around in the refrigerator."

The Harris patent of 1867 presents another instance of obstructed passages for the feeble air currents. The air is expected to enter at the bottom of the box, pass upwardly between the outer and inner walls thereof and thence into the ice compartment. It finds its way by a circuitous route to the provision-chamber where it is supposed to absorb heat from the provisions and then makes its exit to the atmosphere through a passage marked *y*.

The next in order is Koch patent of 1868, which consists of a circular water tank having a tray in its upper portion filled with ice, and an air exit opening in the lid. The ice is supposed to melt, drip into the water in the tank, and cool the latter. A provision-chamber, circular in form, is set bodily into the body of cold water.

The Chase (1869) patent specification states: "My "present invention then may be said to constitute a self-"ventilating, practically air-tight refrigerator, since it does "not depend for success in any material degree upon the "presence of atmospheric air in material quantities." The refrigerator shown was a double-box arrangement, and the space between said boxes was filled with a suitable non-conducting material. The ice was placed in the upper portion of the inner box and provision was made for the insertion of provisions in the lower portion of said box. Warm air from the provision chamber was conducted to the ice through *two tubes in a circuitous manner*, the tubes being inserted between the two boxes and the outlet into the ice-chamber being at the top and center thereof.

In 1870 Hunt conceived the idea of providing a circular metal refrigerator with a *series of revoluble shelves* in the provision-chamber so that upon opening the door the person could bring any portion of any shelf directly opposite the door, thus making the provisions easy of access.

In the Röhrer patent of 1871, the warm air is supposed to rise to the apex of the roof and to find an exit through an aperture in the top thereof. The cold air is expected to descend from the ice-chamber to the provision-chamber over obstructing shelves consisting of numerous angular troughs and angular covering plates.

The construction shown in the patent to Little of 1872 presents again the obstructions due to throttled air-passages and an obstructing drip-pan by which the cooled air cannot descend to the provision-chamber without a change of direction, and while provision is made for the exit at the top of the provision-chamber from the refrigerator of the warm air, no provision is made for supplying fresh air to the ice-chamber.

In 1875 Butler produced a structure which his patent describes as follows:

"My invention *consists*, first, in the construction and arrangement of the *tank or cooler for drinking water* and its position in a refrigerator relative to the ice-pan or rack, whereby room is saved in the refrigerator, and at the same time a large surface of the cooler brought in proximity to the ice and the cooling of the water, aided by the drippings from the ice without intermixing it with the former, and which facilitates the filling and cleaning of the cooler and tank; second, in the arrangement of the reservoir for the drippings from the ice and its connection with the refrigerator, whereby the interior of the refrigerator is rendered spacious, the gases rising from the food placed therein absorbed by the water in the reservoir, the reservoir easily emptied and cleaned, and the use of the pans or other vessels usually placed under the refrigerator as a receptacle for waste water, is dispensed with."

In 1876 Page produced a structure in which the *ice was completely encased in a metal box or ice-pan*, and thus protected from direct contact with the warm air. He provided for the inflow of atmospheric air at the top of his refrigerator, but made no provision for the exit of warm air.

The Smith patent of 1877 is the first to disclose a refrigerator that approximates practical results. Air is taken from the provision-chamber at the top and each side thereof, conducted to the lid of the refrigerator and thence laterally through a space in the lid to a central opening where it descends directly upon the ice. After being refrigerated it is supposed to pass on either side of the ice through openings into the space between the bottom and false bottom of the ice-box to a central opening through which it may descend to the provision-chamber. In some respects this was a fairly good construction, but it had many defects and fell short of the requirements necessary to perfect refrigeration. It is this Smith Patent No. 193,563 that was referred to in the opinion of the court below, and practically the only prior patent concerning which anything need be said. We shall refer to it again at length.

Next in order in the art comes the Hambrook patent of 1878. The Hambrook, or, as it is now called, the New Perfection refrigerator, has two main compartments—an ice-chamber above and a provision-chamber below. The latter is generally divided into two sections by a vertical partition that extends nearly to the bottom of the ice-chamber. The ice-chamber has a centrally-arranged elongated opening in its bottom, whereby cold air may pass to the provision-chamber. At each side of the ice-chamber is a vertical flue, the full width of the ice-chamber, communicating directly with the provision-chamber at its lower end, and with the ice-chamber at its upper end, through a lateral opening in the top of the end walls of the said ice-chamber. Thus a current of cold dry air passes centrally to the provision-chamber without hindrance and without meeting the currents of warm air which pass

upwardly at each side through said flues. An ice-rack in the ice-chamber supports the ice above the floor of the latter, and a deflector plate above the central opening prevents any drip water, or water of condensation from dropping directly through said opening, the deflector being wider than the opening. The sides of the opening are guarded by a trough, and the bottom of the ice-chamber is inclined to drain the drip water to a vertical drainage tube.

The invention lies in the arrangement above described and as pointed out in the claim, whereby a highly successful, satisfactory, and useful refrigerator for domestic purposes is produced. It is simple, cheap and durable, and its simplicity is one of its most meritorious features. The combination of parts set out in the claim is brought together for the first time in the art, and the parts co-act to produce the highly satisfactory results regarding which the several witnesses have testified, and which the appellee is not in a position to deny, for the reason that it is manufacturing and selling the identical thing manufactured by the appellant.

Kearney v. *Ry. Co.*, 32 F. R., 320; *Pullman Co.* v. *Wagner Co.*, 38 F. R., 416; *Lehnbeuter* v. *Holthaus*, 105 U. S., 94; *Electric Co.* v. *La Rue*, 11 Sup. Ct. Rep., 670; and *Gandy* v. *Belting Co.*, 12 Sup. Ct. Rep., 670, are sufficient authority on this point.

Appellant contends that the arrangement of the parts producing the structure of the Hambrook patent is a proper combination under the law, and not an aggregation, as the appellee contends, and that as all the parts tend to the accomplishment of the desired results and the production of the advantages attained by the refrigerator as a unitary structure, it was not necessary

to introduce evidence of a specific and detailed nature as to the advantages resulting from the use in the combination of any particular feature or part. The evidence is general, but sufficiently specific, it is believed. For example, Mr. Belding has said that the refrigerator is the best manufactured; that the most care is taken in its construction; that it has a good circulation; that it does the best work for him, and that it uses the minimum amount of ice, less ice than other household refrigerators use (Rec., 43), and that every one who uses the refrigerator states it to be the best that he has ever used. In this connection it is well to call attention to the fact that the various catalogues of the appellant were introduced in evidence without objection on the part of counsel for the appellee, and that they contain large numbers of printed testimonials which are reprints of letters received from the parties whose names are appended thereto in the catalogues.

Mr. Fred. Ranney had one of the Belding refrigerators in his house for at least four seasons, and he considers the internal construction and the cold air circulation the best of any refrigerator in the market. (Rec., 57.)

Mr. Stanton says that having used several refrigerators of different makes, he has observed that the Hambrook refrigerator "preserves the original flavor of fruits and "vegetables, butter, milk, etc.; that it is more economical "in the use of ice than other refrigerators I have used; "that the air is cool and dry, and the provision-chambers "are free from moisture." (Ans. Q. 16; Rec., 61.)

Mr. Marshall, not in any way connected with the refrigerator business, has used refrigerators manufactured by other people, but testified regarding the Belding refrigerator: "One advantage that I have noticed

"especially is that articles of food, particularly milk, do "not become impregnated with the taste of other things "in the refrigerator. This has been a serious objection "to the refrigerator used previously. I find the walls "of the refrigerator dry and free from sweating, and it "seems to be perfectly ventilated. I consider it the best "refrigerator that I have ever used in every way." (Rec., 67.)

Leonard Gould, in the wooden and willow-ware business, testified that his firm had handled a great many refrigerators for ten years or more; that "We have "handled the Belding all the time, even before it was "made by the Belding Manufacturing Company." The witness meant, however, that he had been handling what was known originally as the Hambrook Perfection Refrigerator as well as the New Perfection Refrigerator made by the Belding Company, which appellant contends also embodies the Hambrook invention. Mr. Gould says: "Our experience has been that the Belding refrig- "erator has given the best of satisfaction. We have sold "all sizes of them; we have sold a great many to gro- "cerymen for use in stores, and without exception they "have given good satisfaction. We never had any "complaints of them, and it is an article that gives uni- "versal satisfaction. We have sold a great many to our "personal friends, and without exception they all speak "of it in the highest terms." (Record, bottom of page 67, top of page 68.)

Mr. Felix, another dealer in woodenware, swears that his firm had handled different kinds of refrigerators for about twenty years, among others the Belding refrigerator, and that "in selling the Belding refrigerator, I will "state that they have given universal satisfaction, and in

"my experience we have never had any complaint of "their quality whatever, which is not the case with other "refrigerators that we have sold. I have used one in my "family and it gives universal satisfaction in every respect. "The provision-chamber always has been dry and the "articles contained therein have always been well pre-"served." (Rec., 77, 78.)

Julia Litchfield purchased one of the old style refrigerators known as the Perfection (or original Hambrook) in 1883, used it from that time on until the date of giving her deposition, January, 1890, and said "it has given per-"fect satisfaction." (Rec., 92.)

Walter M. Howland also used one of the Perfection refrigerators which he purchased from the Booth and Osgood Company in January, 1883, and of this he stated: "It was satisfactory. I do not think any complaint was "made respecting it by the servants who used it, and I "believe that it was always dry in the provision-chamber, "except last summer, when there was a leak in the waste "or drip-pipe, which I had repaired."

Both the Litchfield and the Howland refrigerators were offered in evidence to rebut the allegations of appellee's witnesses Martin, A. W. Ranney, and Hotchkiss, whose testimony tended to show that the refrigerators built prior to the beginning of business by the Belding Manufacturing Company were not successful upon the market and that many were returned to the factory because they were damp, musty and smelled strong. In this connection, we refer again to the fact that some 10,000 Hambrook refrigerators were placed on the market, out of which number the record shows that but *five* were returned to the factory because unsatisfactory. The good condition of the Howland and Litchfield refrigerators, after seven

years of use, sufficiently rebuts the imputation sought to be cast by these three ex-employes of the Belding company.

While none of these patents describe or illustrate or suggest the invention set forth in the Hambrook patent, it is true that several of them show parts or elements similar in purpose to those used by Hambrook. This is not detrimental to the merits of the invention of Hambrook, which does not rest in any one ingeniously contrived separate part, but in the *completed structure*, having a certain mode of operation and possessing certain specific advantages.

Mr. Dayton gives a very instructive statement of the Hambrook invention and of its importance in view of the prior art as disclosed. (Record, page 120 and top page 121.) It will be well, also, to refer at this time to what Mr. Smith says of the Hambrook invention. (Record, near the bottom of page 166 *et seq*. Also first paragraph, page 170, record).

None of the prior patents discloses—as does Hambrook—a refrigerator having an ice-chamber in the top of the box arranged in such manner that the air could and would impinge upon the top, bottom and sides of the ice so that a continuous volume of cold air generated by the melting of the ice, would descend in a dry state through a central opening in the bottom of the ice-chamber to the provision-chamber without material hindrance, and thus causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending central current of cold air. No patentee prior to Hambrook deemed it *necessary* to provide that the descending current of cold air should move

from the ice-chamber to the provision-chamber *without material hindrance or without meeting the ascending currents of warm air.*

One of the particular objects of the Hambrook invention was to produce a structure giving the *minimum resistance* to the air current so that the current of cold air would pass in a *dry state* to the provision-chamber without material hindrance, and without meeting the ascending currents of warm air. Mr. Dayton has stated this feature fully on pages 120, 121 and 122 of the record.

The features of importance variously set forth in the record and which may be summarized as advantages over prior refrigerators, due to the Hambrook invention, are, *first*, a direct, complete and perfect circulation of air within the refrigerator; *second*, a lower temperature; *third*, a more perfect refrigeration of the products placed within the refrigerator; *fourth*, the consumption of a minimum quantity of ice; *fifth*, the dryness of the provision chamber, due primarilly to the perfect circulation and also to the use of the deflector-plate over the cold air opening in the ice compartment; *sixth*, the absence of foul odors in either the ice or provision compartments; and, *seventh*, cheapness and durability of construction. These results are claimed to be sufficient to sustain the patent claim.

It is contended by appellant that these are material and vitally essential features.

II.

ERRORS IN THE OPINION OF THE COURT BELOW.

The opinion of the court below (except so far as it relates to the cross-bill, and concerning which there is no contention here), is as follows:

"In this case I am of the opinion, that in view of former inventions, and the state of the art in reference to the construction of refrigerators at the date of the Hambrook patent, there was no patentable invention in it. There are some features in it that seem like improvements in construction, but there is no new device in it worthy to be called an invention. Among others, the Smith patent of 1877, re-issued in 1878, covered all the essential features of Hambrook's construction, and defendant's refrigerator bears quite as close a similitude to the former as to the latter. The bill must be dismissed with costs."

The court below erred in holding the appellant's patent anticipated by the prior art; that what Hambrook accomplished, did not amount to invention; that the Smith 1877 patent covered all the essential features of Hambrook's construction; that the appellee's refrigerator was as near like the prior Smith patent as the Hambrook patent, and in dismissing the bill of the complainant below.

III.

BRIEF OF THE ARGUMENT.

There are two questions to be considered in this case.

1. Is the Hambrook patent valid in view of the prior state of the art?

2. If valid, is the construction of refrigerator (used alike by appellant and appellee) embraced within the scope of the claim of the Hambrook patent, even if the latter be limited by the state of the art?

If these two questions be answered in the affirmative, as appellant contends they should be, the decree of the court below must be reversed.

It will be remembered that the claim of the Hambrook patent reads as follows:

"In combination, provision-chambers B B, the ice-
" chamber C having rack c^1 and double-inclined bottom
" pieces x and y, provided with a central opening guarded
" by the deflector plate K, and provided also with side
" passages c from the provision-chamber and the trough
" z and the pipe z^1, all substantially as described and
" shown for the purpose set forth."

Referring to this claim, Mr. Dayton says (Record, page 37):

"The claim in my understanding of it includes the combination of the provision *space*, whether it be a single or divided chamber; the ice located over the provision-chamber or chambers; an ice-rack in the provision-chamber for the support of the ice; a two-part inclined partition, substantially horizontal, dividing the ice-chamber from the subjacent provision-chamber or chambers, and having a *central* opening for the down-flow of air from the ice to the provision-chamber, a deflector plate located over this central opening in the said horizontal partition,

troughs or their equivalents and a discharge pipe for conducting water away which falls from the horizontal partition, and for preventing its passage from the central opening to the provision-chamber; and passages *c c* leading upward from the provision-chamber past the ends of the ice-chamber and opening laterally into the ice-chamber near its top. These passages probably include a shield over each of them to prevent ice or other ponderable substances from falling into them when the lid which covers the ice-chest is raised."

(See also Smith's deposition, record, pages 69 and 70.)

It is contended by the appellee that this claim, if valid at all, is a narrow claim limited by its terms, and that no infringement thereof can be held because the absence in its refrigerator of certain elements of the claim in manner specified therein. On the other hand, appellant holds that the infringing refrigerator contains every element of the claim and that where an element has one form in the patent its full equivalent in function and in the combination is found in said refrigerator.

On the question of infringement the appellant does not rely alone upon the depositions of its two experts, Messrs. Dayton, (Rec., 37, 38), and Smith, (Rec., 71), but will refer the court to the depositions of non-technical witnesses and to the statements of customers of both the appellant and appellee. Near the top of page 40 of the record, the top of page 44, and in the answer to Q. 42 on page 45, the witness, Belding, points out the similarities between the two refrigerators. One of the appellant's customers, James W. Nye, testifies, (near the bottom of page 48 and on pages 49 and 50 of record), that his customers could not see the difference between the appellant's and appellee's goods, pointing out fully the points of similarity as the witness, Nye, understood them. Mr. Stanton says substantially the same thing in his answer to Q. 11, (Rec., 60), and Mr. Cutler tells of his experience with

customers and that "they could not see any differ-"ence between the Challenge (appellee's) refrigerator "and the New Perfection" refrigerator. (Rec., 64, 65.)

The appellees are not manufacturing under any patent owned by it, (Rec., 297, C. Q. 1), and the construction of its refrigerators is sufficiently admitted in the answers of the witness, Schofield, to Q. 14 to 16 (Rec., 295, 296), C. Q. 45, 46 (page 302), C. Q. 52 and C. Q. 55, (Rec., 303), and the stipulation or admission of its counsel. (Rec., 55.)

There can be no doubt, therefore, as to the thing used by the appellees being identically the same refrigerator in structure and in function as that made by the appellant. It is contended that the slight variations in the form of the infringing refrigerator from the construction of the patent are not such as vary or change the invention, but are purely mechanical alterations of a minor character, and are such as bring this case fairly within the application of the rule early laid down by this court in determining the question of infringement in *Winans* v. *Denmead*, 15 How., 330, and subsequently expressly affirmed in *Western Electric Co.* v. *LaRue*, 139 U. S., 601.

In Complainant's Exhibit Defendant's Refrigerator the troughs surrounding the central opening in the bottom of the ice-chamber instead of being curved and depressed below the surface of said ice-bottom, are turned up at the edge of the metal lining, thus forming a complete stop for the water, and effectually preventing its dripping into the provision chamber and directing it to the mouth of the drain-pipe *z*, which in the patent is shown near the front of the provision chamber while located at the rear in the infringing machine, as is, however, authorized by the express terms of the patent.

The bottom of the ice-chamber is more nearly horizontal than shown in the patent and the central partition which divides the provision-chamber, instead of extending through the central opening to the bottom of the ice-rack, as shown in the Hambrook patent, extends only part way towards said opening. With these minor differences, complainant's exhibit is a substantial copy of the Hambrook patent and was so found by the experts.

HAMBROOK PATENT SHOWS:	THE REFRIGERATORS BUILT BY BOTH THE APPELLANTS AND THE APPELLEES EMBODY:
(1) Ice-rack of wooden strips.	(1) Ice-rack of corrugated sheet metal.
(2) Bottom pieces inclined to center to drain to a drainage tube.	(2) Bottom pieces more nearly horizontal, with inclination to rear for same purpose.
(3) Depending troughs around central opening.	(3) Edge of metal *upturned* at margins of central openings.
(4) Deflector plate over the central opening is curved.	(4) Deflector plate over central opening is flat.
(5) Central partition in the provision chamber extending up into central opening.	(5) Partition does not extend into but to within a few inches of the central opening.

Mr. Dayton says (Rec., page 39):

"With respect to all these variations in detail from the construction actually shown in the Hambrook patent, I notice that they are all copied from the complainant's refrigerator as constructed under this Hambrook patent. With respect to the remaining details of construction there is no variation from the patent."

In answer to question 9 (bottom of page 71 record), Mr. Smith corroborates Mr. Dayton, saying:

"The relative *arrangement* of all these parts is the same as shown in the drawing, and all the physical effects, as regards circulation would be precisely the same."

"Authorities concur that the substantial equivalents of a "thing, in the sense of the patent law, is the same as the

"thing itself, so that if two devices do the same work in "substantially the same way and accomplish substantially "the same result, they are the same, even though they "differ in name, form and shape."

Machine Co. v. *Murphy*, 97 U. S., 120.

See, also,

Cochrane v. *Deener*, 94 U. S., 780.
Clough v. *Barker*, 106 U. S., 166.
Imhauser v. *Buerk*, 101 U. S., 647.

It is contended by the appellant, therefore, that the slight changes of certain parts of the structure from the *particular form* shown in the drawings of the Hambrook patent to the form present in both refrigerators (remaining as said slightly changed parts do in the same relative positions and producing the same results), are fully justified and are embraced in the claim, and that the defense of non-infringement cannot be maintained.

The appellees' contention that complainant's patent is invalid rests entirely upon the deposition of James W. See, supported by such prior patents as he has introduced.

Mr. See makes pretensions of giving a correct statement of the state of the art prior to the date of the Hambrook invention, but as a matter of fact he has simply pointed out and emphasized the fact that certain of the individual elements specified in the claim of the Hambrook patent were old in the refrigerator art, and from which he concludes that the Hambrook claim is for an aggregation and therefore invalid.

This method of dissecting a patent and then attempting to anticipate it piecemeal early found supporters, and is being constantly urged even in face of the explicit rule of this court in *Parks* v. *Booth*, 102 U. S., 96.

(Also in *Prouty* v. *Ruggles*, 16 Peters, 341, and *Gill* v. *Wells*, 22 Wall 14), to the effect that an invention is not necessarily the creation of a new structure, every portion of which is *also new*, but may include elements, every one of which were old either in the same art or in analogous arts. A patent cannot be invalidated, therefore, by showing simply that its several features are separately old.

The rule, above referred to, and believed to be specially applicable to the case at bar, was stated by Mr. Justice CLIFFORD, in the following language:

"Where the thing patented is an entirety, consisting of a separate device, or a single combination of old elements incapable of division or separate use, the respondent cannot make good the defense in question by proving that a *part of the entire invention* is found in one prior patent, printed publication or machine, and another part in another, and so on indefinitely and from the whole or any given number, expect the court to determine the issue of novelty adversely to the complainant.

Common justice forbids such a defense, as it would work a virtual repeal of so much of the patent act as gives to inventors the right of a patent consisting of old elements where the combination itself is new and produces a new and useful result. New elements in such a patent are not required, and if such a defense were allowed, not one patent of the kind in a thousand of modern date could be held valid. Nor is such a defense consistent with the regulations enacted by Congress in respect to the procedure in litigations in respect to patent-rights."

Parks v. *Booth*, *supra.*

In his deposition Mr. See insists that every feature or element is found in *some one or* more of the prior patents, and that, *therefore*, the Hambrook patent is invalid. In examining each prior patent, this question should be asked, in view of these decisions:

Does *this* patent alone show and describe a refrigerator having the parts or elements set forth in the claim of the Hambrook patent combined as therein stated to produce the same result? If not, it does not anticipate the Ham-

brook patent. Appellant contends that no prior patent will be found, from the Sanford to the Smith, that can be fairly said to show or even suggest the Hambrook patent. Smith most nearly approached him, and as this one patent was the only one referred to by the court to anticipate Hambrook, we will now proceed to consider it.

The Smith patent *lacks at least two of* the characteristic features of the Hambrook construction and elements of the Hambrook claim. *It lacks entirely a deflecting plate or an equivalent thereof*, over the central opening in the bottom of the ice-chamber, and its up-take flues *do not discharge into the sides* of the ice-chamber at the top thereof. Even appellees expert, See, admits these and other differences of construction. (Record, p. 289.)

These up-take flues are continued through spaces in the cover itself, which meet and open into the ice-chamber, at the middle of the lid. A result of this prolongation of the warm-air flues, into and through the lid of the ice-chamber, is not only a great loss by the warming of the air through its contact with the external boards of the lid, but the production of a proportionately greater amount of friction, and a corresponding retardation of the air currents, which result is increased by the addition of one or more elbows or bends in each of said up-take passages before the air reaches the ice-chamber, thus proportionately affecting the entire circulation of the refrigerator, because the cold air can descend no faster than the warm air passes to the ice-box.

The absence of a deflector over the central opening in the bottom of the ice-chamber, of course, allows any drip from the superposed ice-rack to fall through said opening into the provision-chamber, and as a consequence, it is impossible to maintain the provision-chamber in a dry state;

and a principal object of the Hambrook patent, which consists in obtaining the utmost dryness of the provision-chamber is not attained.

The court is referred to Dayton's deposition (Rec., 135, 136, and top of page 137), and to Smith's deposition (Rec., 169, 170), for further details regarding the insufficiency of the Smith patent to anticipate Hambrook. Water will fall through the opening *e e*, and over the front and rear edges of this imperforate central portion of the ice-rest, and that it will adhere in drops to the under surface thereof and will in this form be carried along by the air-current towards the central opening in the subjacent bottom, where meeting each other, or being no further impelled by the air-currents, they will drop through said opening into the provision-chamber. By the insertion or addition of a separate deflector, the drippings above referred to would be caught and carried to opposite sides of the opening and dropped on the bottom itself and not through the opening therein. While the Smith patent, therefore, contains some of the general features of the Hambrook refrigerator as described and claimed in this patent, it fails by reason of the differences above pointed out, to contain the invention specified by Hambrook in his patent and claim.

Another serious defect of the Smith device seems to be in the upturned flange around the margin of the central opening of the horizontal partition, which upturned edge extends quite close to the bottom of the ice-box proper, very materially contracting the space between them and effectively throttling the circulation. The construction as well as the object of the Smith refrigerator is different from that set forth in the Hambrook patent. The *results* accomplished by the different

construction of Smith are very inferior to and therefore very different from those attained by the Hambrook invention. The Smith patent, therefore, is not an anticipation of the Hambrook patent.

Appellant further contends that the court below erred in finding that the Smith patent "covered all the essential "features of Hambrook's construction," and that this ruling should be reversed. The Smith patent (Rec., 332, *et seq.*) clearly reveals the fact that its novelty consisted in (1) a *false bottom I*, to his ice-chamber, and (2) the *air-box K* in the lid. He had no thought of doing what Hambrook did. That his refrigerator might be altered into the Hambrook is not sufficient to invalidate the latter's patent under the rule in *Clough* v. *Gilbert & Barker*, 106 U. S., 166.

One of the necessary features of a successful refrigerator is the refrigeration of the warm air in the upper part of the ice-box and a condensation of its moisture by contact with the ice, and this is best attained when there is a perfect circulation of air within the refrigerator. The refrigerated dry air should descend upon the substances below, abstract the heat therefrom, and upon becoming warm and rarified should be returned to the upper portion of the ice-chamber to be again brought into contact with the ice, and thereby cooled. A most important feature to be borne in mind is the very slight difference in temperature between the air at the top and bottom of the refrigerator. This is a controlling difference because the *circulation* of the air with in the refrigerator manifestly depends solely upon the difference in temperature, and consequently, the more *minute this difference*, the feebler will be the movement of the air current and the more easy it will be neutralized by any ob-

structions. Hence we note that Hambrook in his specification stated in the second paragraph that his invention consisted in a construction by which the cold air would descend to the provision-chamber *without material hindrance*, and that the warmer air would ascend through open spaces at each side of the ice-chamber *without meeting the descending current of cold air*.

The circulation of air will be best attained by interposing obstacles as seldom as possible. Every inch of surface that the current passes over unnecessarily is an obstacle—every change of direction required is an obstacle—everything which impedes the flow is an obstacle. Inventors prior to Hambrook do not seem to have appreciated these facts.

It should be the aim to allow the cold air to pass from the ice as directly as possible into the chamber to be refrigerated. The differences in temperature at top and bottom will at best be very slight, and the force to overcome resistance and produce circulation will be correspondingly slight. As is well understood, there will be no practical circulation until *all the resistances have been overcome*. After expending whatever force is necessary to overcome all the resistances, the surplus will be expended in producing circulation, and it needs no extended argument to show that the slight differences in temperature will produce an air current having little or no force, and that any friction or any change of direction is a resistance which goes to weaken the originally feeble force.

It is one thing to *appreciate* a general physical fact—as, that the circulation of air is due to a difference in temperature—and it is an entirely different thing to understand the laws and conditions of its action so as to *intelligently select and arrange known elements to produce the*

best and certain desired results, and it seems quite clear from this record that no patentee prior to Hambrook exhibited any understanding of the obstructive conditions to be dealt with.

We have pointed out that the prior art does not show any anticipating structure, and that the adoption and use by the public must strongly tend to support patentability. We maintain that the presumption of validity arising from the grant of the patent, is not to be overlooked in a case such as this. The rule is most clearly laid down in *Coffin* v. *Ogden*, 18 Wall., 120 (and followed in *Smith* v. *Dental Vulcanite Co.*, 93 U. S., 487, *Lehnbeuter* v. *Holthaus*, 105 U. S., 94, and *Cantrell* v. *Wallick*, 117 U. S., 689), to the effect that the *presumption of law is in favor of the patent, that the burden of proof to show to the contrary is on him who attacks it, and his proof to overcome the presumption must be beyond all reasonable doubt.*

That there can be any question of the validity of the Hambrook patent seems singular, notwithstanding the opinion of the learned judge who tried the case below, but whatever doubt there may be the patentee is entitled to it. Certain it is that the proofs offered by the appellant are not sufficient to overcome, beyond all reasonable doubt, the presumption in favor of the patent. The policy of the patent law and of this court is one of liberality to just and meritorious inventors. The rule of this court that *the patent should be construed in a liberal spirit so as to stand rather than fall*, as expressed in *Hogg* v. *Emerson*, 6 How., 437; *Corning* v. *Burden*, 15 How., 252; *Winans* v. *Denmead*, 15 How., 330; *Battin* v. *Taggert*, 17 How., 74; *Terrill* v. *Ry. Co.*, 1 Wall., 491; *Goodyear* v. *Rubber Co.*, 2 Wall., 356; *Commissioner* v. *Whitely*, 4 Wall., 522; *Rubber Co.* v. *Goodyear*,

9 Wall., 788; *Klien* v. *Russell*, 23 Wall., 433; The Corn Planter Patents, 23 Wall., 181; *Sewall* v. *Jones*, 91 U. S., 171; *Merrill* v. *Yeomans*, 94 U. S., 568; *Loom Co.* v. *Higgins*, 105 U. S., 580; *Ry. Co.* v. *National Brake Co.*, 110 U. S., 229; *Yale* v. *Sargent*, 117 U. S., 536; *Magowan* v. *N. Y. Belting & P. Co.*, 141 U. S., 332; *Gandy* v. *Main Belting Co.*, 143 U. S., 587; *Sessions* v. *Romadka*, 145 U. S., 29; *Washburn & Moen Mfg. Co.* v. *Beat-Em-All Barbed Wire Co.*, 143 U. S., 275, and *Krementz* v. *S. Cottle Co.*, 148 U. S., 556, is in accordance with a proper appreciation of the value of the patent system, and the patent in this case is entitled to the fullest application of the rule.

And if a new combination or arrangement of known elements or devices produces a new and beneficial result never before attained, this is evidence of invention, as this court has said in Gill v. *Wells*, 22 Wall., 1, and *Smith* v. *Vulcanite Co.*, 93 U. S., 475; (also in *Fuller* v. *Yenzer*, 94 U. S., 297; *Webster Loom Co.* v. *Higgins*, 105 U. S., 591; *Magowan* v. *Packing Co.*, 141 U. S., 332; *Mfg. Co.* v. *Beat-Em-All Barbed Wire Co.*, 143 U. S., 275; *Sessions* v. *Romatka*, 145 U. S., 29; *Topliff* v. *Topliff*, 145 U. S., 156; *Krementz* v. *S. Cottle Co.*, 148 U. S., 556). This ruling has been followed, and properly, by the Circuit courts of appeals in *Haffcke* v. *Clark*, 1 C. C. of A., 570; *Jones Co.* v. *Mfg. Co.*, 1 C. C. of A., 158, and in *Watson* v. *Stevens*, 2 C. C. of A., 500, and it is contended that this case comes also within this ruling.

Appellant maintains that the claim of the Hambrook patent is a legitimate combination claim, that it covers a unitary structure, that its several parts co-act to perform the novel and beneficial results hereinbefore referred to, and which have been testified to by Belding, Dayton,

Smith, Stanton, Ranney, Nye, Gould, Felix and other witnesses, and that therefore said claim sets forth and covers an invention within the meaning of the decisions of this court above referred to. As such it should be upheld. It is not contended that a broad interpretation should be given, but that a fair consideration of the claim in view of the record, must result in upholding the patent and protecting the appellant, thereby, in the proper enjoyment of its vested rights.

The advantages of the invention are indicated by the success that the refrigerators met with upon the market. As before stated, some 10,000 "Perfection" refrigerators had been sold prior to the beginning of the manufacture by the appellant. Mr. Belding, president of the appellant company, says that some 4,000 "New Perfection" refrigerators were sold the first year (1884) that the Belding Company put them upon the market, and that at the date of giving his deposition (1889) the company was selling four times that number, or at the rate of 16,000 per year. (Rec., 42.) In 1884 the investment of the Belding Company in the refrigerator business was the amount of its capital stock,—$25,000. In 1889, five years later, the capital stock had been increased, and the total investment in the refrigerator business amounted to $175,000. (Rec., 42, 63.) Mr. Stanton states that the appellant's sales for 1888 were over 12,000 and that the capacity of the Belding Company was, at that time, 35,000 per year. To these numbers must be added the large quantities sold yearly by the appellee, amounting probably to as many more.

It now seems clear from recent decisions of this court that the adoption and extensive use of the invention by the public are factors in determining the presence of inven-

tion and should control if the question of patentability be in doubt. (*Washburn & Moen Mfg. Co.* v. *Beat-em-all Barb Wire Co.*, 145 U. S., 275; *Loom Co.* v. *Higgins*, 105 U. S., 580; *Smith* v. *Vulcanite Co.*, 93 U. S., 486; *Topliff* v. *Topliff*, 146 U. S., 156; *Consolidated Valve Co.* v. *Valve Co.*, 113 U. S., 157; *Magowan* v. *Belting Co.*, 141 U. S., 332; *Gandy* v. *Main Belting Co.*, 143 U. S., 587; *Sessions* v. *Romadka*, 145 U. S., 29), and in this case the evidence is conclusive that the Hambrook invention met with immediate public approval. The effort made by the appellee to show that refrigerators made *precisely* after the form shown in Hambrook's patent were not a success has signally failed, appellant having produced several old style Hambrook refrigerators built in the identical *form* illustrated in the patent which the owners thereof testified as being *possessed of great merit*, and which *are to-day in perfect condition.*

Moreover, inasmuch as the appellee is manufacturing and selling the identical construction manufactured and sold by the appellant, it is precluded from denying the value and utility of the invention (*Electric Co.* v. *LaRue*, 139 U. S., 601; *Gandy* v. *Main Belting Co.*, 12 Sup. Ct. Rep., 799; *Lehnbeuter* v. *Holthaus*, 105 U. S., 94; *Pullman P. C. Co.* v. *Wagner P. C. Co.*, 38 F. R., 416; *Kearney* v. *Lehigh Valley Ry. Co.*, 32 F. R., 320), and must rely solely upon the prior art to sustain its defense of invalidity.

The record discloses beyond question that the patentee put his device upon the market; that more than 10,000 of these refrigerators were sold prior to the date of the purchase of the business and letters patent by the Belding Company; that these refrigerators were so perfectly constructed that their success upon the market cannot be

successfully controverted, and that only five refrigerators were returned, out of 10,000 sold, as being improperly constructed; that the present construction of refrigerators by the appellee embodies in its details the full and complete equivalent for all elements of the Hambrook patent that are not accurately copied; that the infringement was deliberate and with intent to profit by appellant's trade and experience; that defendant below sent its superintendent to the Patent Office, where he made a diligent search and thorough examination among the patents there found, including the Hambrook, to ascertain the state of the art of refrigerators before beginning its infringement; that before beginning to manufacture, this same person inspected the Belding Company's factory on two different occasions, purchased one of the Hambrook refrigerators as then made, had it shipped to his factory, there examined it, and then copied it in detail; and finally, that no single prior patent illustrates or suggests the Hambrook invention as set out in his claim.

Appellant, therefore, contends that the Hambrook patent is not only valid, but that its claim is infringed because the appellee's structure is identical with that of the Hambrook patent, assuming the claim of the latter not to be restricted to the exact and precise form of every one of its elements. The claim is one for a combination of parts, but appellees should not be allowed to appropriate the invention because it substitutes a well-known mechanical equivalent for any given part to do precisely the same work in the combination as the part described in the claim. This is the rule expressly laid down in *Rowell* v. *Lindsay*, 113 U. S.. 97; *Fay* v *Cordesman*, 109 U. S., 408 and others. Appellee's action in this direction is not even clever. It is a cold-blooded, inexcus-

able piracy of the appellant's construction without any change.

That the invention set forth in the Hambrook patent was novel at the time the patent was granted, is established by the fact that no prior patent shows or obviously suggests a combination of the same or equivalent parts, assembled together in a manner to operate on the same principle or to produce the same result. That appellant's patent is valid under the decisions referred to, is established by ample testimony, showing the practical advantages and commercial success of the refrigerators made under said patent. That the refrigerators made both by appellant and appellee came within the scope of the patent is established by the substantial correspondence in structure and operation of said refrigerators with the device shown in the patent. Infringement by appellee can not be denied, because appellant's refrigerators clearly come under the patent, and the alleged infringing structure is identical, both in its main features and details, with that made by appellant. That the equities of the case are with appellants, is shown by the fact that appellee has sold refrigerators so like those made by appellant as to deceive the public, and to lead purchasers to buy the same under the belief that they are the same in structure and equally as good as those of appellant.

It is urged that the decree of the court below should be reversed, and the cause remanded with instructions to enter a decree in favor of the complainant, and to proceed according to the usual course of equity.

Respectfully submitted.

TAYLOR EVERETT BROWN,
CHARLES CLARENCE POOLE,
Counsel for Appellant.

CHICAGO, January 5, 1894,

FILED.
JAN 30 1894
JAMES H. McKENNEY,
CLERK

IN THE

Supreme Court of the United States

THE BELDING MANUFACTURING COMPANY,
Appellant,
vs.
THE CHALLENGE CORN PLANTER COMPANY,
Appellee.

In Equity,
No. 235.
October Term
1893.

APPEALED FROM U. S. CIRCUIT COURT FOR WESTERN DISTRICT OF MICHIGAN.

BRIEF AND ARGUMENT FOR APPELLEE.

MR. EDWARD TAGGART,
MR. ARTHUR STEM,
Counsel for Appellee.

PRESS OF W. F. ROBERTS WASHINGTON

IN THE

Supreme Court of the United States

THE BELDING MANUFACTURING COMPANY,
Complainant,
vs.
CHALLENGE CORN PLANTER COMPANY,
Defendant.

In Equity.
233

BRIEF AND ARGUMENT FOR DEFENDANT.

The bill alleges the infringement of refrigerator patent issued to R. T. Hambrook, May 28, 1878, No. 204,216.

The answer denies—First: the validity of the patent. Second: infringement by defendant. Third: alleges abandonment, and that complainant did not mark its refrigerators "Patented."

The case was argued before the Honorable Judge Severens, and a decree entered dismissing the bill with costs against complainant. From this decree complainant appealed.

The opinion of Judge Severens is contained on page ten of the printed record.

Hambrook Refrigerator.

The refrigerator shown and described in the Hambrook patent, consists in an outer case or box of the ordinary form; an ice-chamber *C* occupying the upper part of the case; two provision chambers *B-B* beneath the ice-chamber; two openings from the ice-chamber, one into each provision-chamber for the descent of the cold air. These openings are shown by d. An ice rack or open work ice support C′ to support the ice; a

curved deflector *K* to prevent the water which passes through the ice-rack from dripping into the provision-chambers; two warm-air flues *c-c* from the provision-chambers to the ice-chamber. These flues are located at the sides of the case. Two troughs *z-z* to receive the water from the bottom of the ice-box; bottom pieces *x* and *y* inclining downwards toward the central partition, and waste-pipe z' which receives the water from *z-z*. A partition *a*, entirely separating the provision-chambers and extending upwards between the bottom-pieces to the ice-rack and supporting the deflector K,

The specification supports two modifications.

In one the partition *a* extends to the top of the ice-chamber. entirely dividing the refrigerator into two parts. The other modification substitutes a drip-pan *s-s* in place of the branched part of the pipe *z'*, which drip-pan receives the water directly from the troughs *z-z*.

State of the Art.

Before analyzing the Hambrook patent, we desire to consider the state of the art. There are two patents which have been extensively litigated in the courts, viz :

Lyman patent, No. 14,510.

Sanford patent, No. 13,802.

The Lyman invention antedated the Sanford invention, as shown in several suits arising out of these patents.

Decisions on the Lyman Patents.

The Lyman invention appears to be a valuable one, and was extensively litigated.

The patent was sustained in the Northern District of New York in March, 1872, in the case of Lyman *vs.* Myers—decision by Judge Hall. It was again sustained in the Eastern

District of New York, January, 1874, in the Lyman Patent Refrigerating Company *vs.* Oswald—decision by Judge Benedict.

Again sustained in the Southern District of New York, September, 1874, in The Lyman Ventilating Refrigerating Company *vs.* Lalor, decided by Judge Blatchford and reported in 12 Blatchford, 303. The patent was before the court on motion in January, 1875 (before Judge Wallace), reported in 12 Blatchford, 465. It was again in court in August, The Lyman Ventilating & Refrigerating Company *vs.* Chamberlain, reported in 10 O. G., 588, September 23, 1876.

This was more than twenty years after the patent was issued, and is the last litigation over the Lyman invention, so far as we know.

In the suit reported in 12 Blatchford, 303 (The Lyman Ventilating & Refrigerating Company *vs.* Lalor), the judge reviews the Lyman invention at considerable length, in a decision covering eighteen closely printed pages, and from which we quote:

"The first claim was sustained in two suits on final hearing; one before Judge Hall in the Northern District of New York, in March, 1872 (Lyman *vs.* Myers), and the other by Judge Benedict in the Eastern District of New York, in January, 1874. (Lyman Patent Refrigerating Company *vs.* Oswald)."

Referring to the alleged anticipations the court says:

"In fact, the more numerous and diversified the forms and arrangements which existed prior to Lyman's, the more certain it is that none of them reached the principle of Lyman; because his, once practically developed by him, superseded the prior structures."

Again:

"It does not appear that the extensive use now made of structures substantially like Lyman's, is traceable to any of those alleged prior inventions. I find that Judge Benedict in the Eastern District of New York enjoined, under this patent,

the structure of one Able, which has no opening in the bottom of the ice-box for the passage of the cold air, but had one entire side of the ice-box slotted vertically, except adjacent to the top and bottom, so that the air passed in near the top and passed out near the bottom. I concur in the correctness of that decision. In accordance with such view, the arrangement of Lalor with the egress opening in the side of the ice-chamber is of *a fortiori* an infringement of the first claim of the patent. If the egress be through the bottom, there is equally an infringement of such claim. In order to infringe, it is not necessary that there should be a tube, chamber, or conduit below the ice-box to conduct the cooled air from the ice-box, to, or near to the bottom of the refrigerating chamber. As before stated, the sides of the ice-box are a conduit."

The court sustained the patent and enjoined various devices. Among those named are the following:

Lalor, Kopp, Dorn & Smitzer, Anye, Hoffman, Cunningham, Schlang, Schafer, and possibly others. The Bolt refrigerator had been enjoined in a former suit.

Sanford Patent Decisions.

The Sanford invention went into use and proved valuable, as appears by the decisions hereinafter cited.

As it was of a later date than the Lyman invention, the decisions were, with one exception, against the validity of the patent. In Roberts *vs.* Harnden, 2 Cliff. 500, in October, 1865, Judge Clifford sustained the patent.

Defendant's device in that case did not have any partition excepting the side of the ice-chamber.

The court says:

"But the respondent insists that the currents in his machine move in all directions, and this seems to have been conceded." (see p. 505)

In regard to the utility of the Sanford refrigerator, Judge Clifford says:

"The utility of the invention, when constructed as directed in the specification, can not be doubted."

In this suit there was no sufficient proof as to the anticipation by the Lyman invention. The Lyman invention was referred to, but the proof was held insufficient.

ROBERTS *vs.* BUCK, 1 Holmes 224.

This suit involved the validity of the Sanford patent, and was decided adversely to the patent on reference to the Lyman refrigerator, which was clearly shown to have antedated the Sanford invention.

The case was appealed to the Supreme Court of the United States and was decided with the case of Roberts *vs.* Ryer, hereinafter referred to.

ROBERTS *vs.* DODGE.

Decided by Judge Blatchford adversely to the Sanford invention on reference to the Lyman invention. The case is reported in the third O. G., page 269.

ROBERTS *vs.* RYER, 11 Blatchford 11.

Decided in March, 1873. In this case Judge Blatchford reviews the case of Roberts *vs.* Harnden, thus:

"This construction of the specification is that indicated in the case of Roberts *vs.* Harnden. In that case the partition in the defendant's machine did not extend below the lower end of the side of the ice-box, and, in fact, the side of the ice-box constituted the partition to keep separate the ascending currents and the descending currents."

On pages 20 and 21 of the decision is found a description of the defendant's device, which contained no partition excepting the wall of the ice-box, and the court found that to be within the Lyman invention.

In reviewing the scope of the Lyman invention, on page 23, the court says:

"All these structures embody the combination and mode of operation, before stated, as found in the defendant's refrigerating room and in the plaintiff's structure."

(Page 26.) "Between 1852 and 1855 at least a dozen closed refrigerators of like construction were made at the Novelty Iron Works in the City of New York according to the plans furnished by Lyman. In some of them the conduit extended down one and one-half inches in the ice-chamber under the ice grate."

The several alleged infringing devices are described and they were all held to have been within the scope of the Lyman invention, as was also the Sanford Patent Refrigerator.

ROBERTS *vs.* RYER, 91 U. S., 150-158.

This is an appeal from the decree in Roberts *vs.* Ryer reported in 11 Blatchford, 11. The case was decided by Chief Justice Waite more than twenty years after the date of the Sanford patent and about twenty-four years after the date of the Lyman invention.

The opinion and its reasoning agrees in substance with the opinion of Judge Blatchford. Referring to the Lyman invention (p. 156) the court says:

"There was, therefore; in this invention of Lyman, the open bottom ice-box and the partition open above and below dividing the refrigerator into two apartments."

Again referring to the Lyman invention, the court says:

"True, the partition was not vertical, and the apartment need not be of equal or any particular proportionate size; neither was this necessary, as has been seen in the Sanford patent."

Thus the Lyman invention and the Sanford refrigerator were the pioneer refrigerators having an air circulation in an enclosed structure. Their great utility has been repeatedly referred to by the courts, and their value is attested by the fact that they were the subjects of litigation more than twenty years after the patents were issued.

In our judgment, they fully anticipate the alleged Hambrook invention.

The Lyman patent was issued March 25, 1856, and it contains as elements—

1. An ice-chamber occupying the upper part of the case, in all respects the equivalent of the Hambrook ice-chamber.

2. An ice-rack of the same construction as the Hambrook rack *c'*.

3. An inclined bottom piece, corresponding exactly with one of the inclined bottom pieces of the Hambrook refrigerator.

4. A cold-air opening over the ice-chamber into the provision chamber, corresponding with the opening d of the Hambrook refrigerator.

5. A deflector over the cold-air flue to prevent dripping of water, the equivalent of the deflector *K'* of the Hambrook.

6. A provision-chamber, the full equivalent of the provision-chamber *b* of the Hambrook.

7. A warm-air flue, similar to the Hambrook passage *c*.

8. A trough at the lower part of the inclined bottom, precisely as the trough of the Hambrook.

9. A waste-pipe to carry the water from the trough *z*. The Lyman shows a conduit below the ice-chamber, but the patent says this "may be of different lengths according as the blast is to be more or less forcible; the higher the column the greater being the weight and velocity of the discharge."

The suits in the United States Courts show that this conduit, in many cases, did not extend below the ice-chamber, and it was never treated as an essential element of the invention by Lyman or by the courts, and very many of his refrigerators did not contain it.

Hambrook merely duplicated the Lyman refrigerator. He added nothing new, and obtained no new result, and no new mode of operation.

SANFORD PATENT, No. 13,802.

This patent was issued November 13, 1855. The refrigerator shown in the specifications and drawings operates upon substantially the same principle as the Lyman refrigerator,

although in our opinion it differs from the Lyman refrigerator, in construction, far more radically than does the Hambrook differ from the Lyman.

The Lyman patent has been repeatedly held to be a full anticipation of the Sanford.

We therefore think that Lyman fully anticipated the so-called Hambrook invention.

BANTA PATENT, No. 60,665, dated January 1, 1867.

This structure shows the general principle of air circulation in a refrigerator, and contains water deflectors to prevent the water from the melting ice from entering the provision chamber.

KOCH PATENT, No. 77,624, dated May 5, 1868.

This patent shows a refrigerator, with an ice-rack and water deflector beneath the ice-rack.

CHASE PATENT, No. 95,428, dated October 5, 1869.

The structure shown in this patent is a modified Lyman refrigerator. It contains:

1. Ice-chamber above the provision chamber.
2. Provision-chamber.
3. Ice-rack.
4. Inclined bottom piece.
5. Trough like the Hambrook trough *z*.
6. Deflector.
7. Cold-air duct.
8. Two upwardly extending warm-air ducts.

Practically, this structure shows every element of the Hambrook refrigerator, although, perhaps, the Hambrook is copied more directly from the Lyman than from the Chase.

The drawing in the Chase patent shows a refrigerator with the ice-chamber contracted, but the specifications calls for other forms, and suggests an ice-chamber of the same width as the provision-chamber.

PAGE PATENT, No. 175,143, dated March 21, 1876.

The specification of this patent shows a refrigerator having a circulation that does not enter the ice-chamber.

Its pertinence to this case consists in the bottom of the refrigerating chamber, and a deflector, which parts complainant's experts admit to be the full equivalent of the deflector *K* of the Hambrook patent, and the bottom pieces *x* and *y*.

A model of these parts is in evidence, and shows that Page used precisely the form which defendants now use.

ROHRER PATENT, No. 121,889, dated December 12, 1871.

This refrigerator shows an ice-chamber, an ice-rack, a series of deflectors, a trough, warm-air flues, cold-air flues, provision-chamber and inclined bottom pieces. In fact, it shows substantially everything arranged in the same manner as in the Hambrook.

The drawing shows a provision for ventilating the refrigerator at the top, which appears to have been so constructed that it may be opened or closed.

The deflectors serve the same purpose as the deflector *K* of the Hambrook patent.

YOST PATENT, No. 23,803, dated April 26, 1859.

This patent shows deflectors used for the same purpose as the deflector *K* of the Hambrook patent.

HUNT PATENT, reissued, No. 4,789, dated March 5, 1872.

This structure shows a cylindrical refrigerator, but the inventor says it may be of any desirable form.

A small model of this refrigerator was offered in evidence. It contains every element of the Hambrook claim, except the double provision-chambers, divided by a central partition, and it operates on precisely the same principle as the Hambrook.

It has an ice-chamber located at the top, a provision-chamber below the ice-chamber, an ice-rack, deflectors, water

troughs, waste-water pipe, warm-air flue and cold-air flue. The circulation of the air is caused by the ice in the ice-chamber which chills the air in the ice-chamber, causing it to descend, driving the warm-air up through the warm air flues into the ice-chamber.

LAW PATENT, No. 62,644, dated March 5, 1867.

The Hambrook refrigerator is copied, in its general form, from the refrigerator shown in the Law patent.

The Law refrigerator contains—

1. The ice-chamber in its upper part.
2. Provision-chamber below the ice-chamber.
3. The double-inclined bottom pieces like the Hambrook.
4. Cold-air opening at center, but not divided by a partition.
5. Two warm-air flues, one at either side as in the Hambrook.
6. Deflectors over the warm-air flues.
7. Corrugated ice support for supporting the ice. This ice support is impervious, the same as in the defendant's machine, and to that extent differs from the ice-rack of the Hambrook.
8. A trough to carry off the water.
9. A pipe to carry off the waste-water.

The combination and arrangement of parts is the same as that of the Hambrook aside from the central partition, which, in the Hambrook patent, extended up into the ice-chamber. The trough being placed below the lower edges of the double-inclined bottom pieces, takes the place of the deflector in the Hambrook.

In many of the refrigerators, older than the Hambrook, the water deflector is found, and in many the trough is shown as in the Law.

They were well-known equivalents of each other long before the supposed Hambrook invention.

FISHER PATENT, No. 133,147, dated November 18, 1872.

This patent shows:

1. An ice-chamber above the provision-chamber.

2. A provision-chamber.
3. A corrugated imperforate ice-support.
4. The bottom of the ice-chamber inclined to the center.
5. Cold-air flues.
6. Deflector over cold-air flues.
7. Warm-air flue.
8. An ice-guard or deflector over the warm-air flue.
9. Waste-water pipe.

There is no substantial difference in operation between the Fisher refrigerator, the Lyman refrigerator, and the Hambrook refrigerator.

The Fisher refrigerator, it is true, has its cold-air flues at the ends of the ice-chambers instead of in the middle, but the evidence shows that at least two-thirds of the refrigerators made by the R. T. Hambrook Company were of the form shown in the Lyman; or, in other words, one-half the Hambrook refrigerator as shown in his patent.

SMITH PATENT, No. 193,563, Dated July 24, 1877; also Reissued 8,463.

This refrigerator is the model after which both the complainant and the defendant copied, and a comparison of their refrigerators with the Smith patent will show that defendant's refrigerator differs from the Smith refrigerator only in that it does not carry the warm-air flues to the top of the ice-chamber, but opens them into the ice-chamber—one at either side.

The Smith refrigerator was named the "Alaska," and is more frequently referred to by that name than any other.

The evidence, which we shall refer to hereafter, shows that complainant abandoned the Hambrook structure and copied from the Alaska refrigerator.

Hambrook Patent.

We will examine the specifications and claims in order to determine therefrom the scope of this patent. In the second paragraph of his specification the inventor proceeds to state the nature of his invention as follows:

"The nature of my invention consists in the construction of a refrigerator having the ice-chamber constructed in such a manner that the air will impinge from the top, bottom and sides of the ice, and the continuous volume of cold air generated by the melting of the ice, will descend, in a dry state, to the provision chamber without material hindrance, causing the displaced and less frigid air to ascend to the ice-chamber through open spaces at each side thereof without meeting the descending current of cold air."

This statement would indicate that the inventor supposed himself to be the first to discover the principle of air circulation in refrigerators, and that was doubtless his idea at the time of filing his application, but this was not the fact, as his statement of invention would apply as well to a dozen older refrigerators as to his, and he therefore disclaims as follows:

"I do not claim an outside box and an inside provision chamber or their combination; neither do I claim the fixed air space between the two, or other mode of insulation; neither do I claim the principle of ventilating provision-chambers by means of a descending current of cold air displacing and causing to ascend the less frigid air; nor do I claim the partitioning of the provision-chamber into two compartments; nor yet do I claim the affixing the trap or siphon to the waste pipe."

He therefore abandoned the broad claims of his original application, and was content to receive the one specific claim which is found in the patent. He was thus compelled to disclaim the entire statement of the nature of his invention, to recognize the state of the art, and to admit that the entire principle of his invention was old at the date of filing his application, thereby limiting his claim to the specific form described. The statement of the nature of the invention therefore does not in any way assist us in the construction of the patent, and we have nothing but the description of the mechanical construction of the refrigerator and the claim at the end of such description from which to determine the scope of the invention.

Upon an examination we find as elements of the claim the following :

1. Provision-chambers B, B.
2. Ice-chamber C.
3. Ice-rack c'.
4. "Double-inclined bottom-pieces x and y, provided with central opening."
5. Deflector plate K.
6. "Side passages, c," or side pieces as described in the specification, 7th paragraph, page 1.
7. Trough Z.
8. Pipe Z'.

"All substantially as described for the purpose set forth."

The two provision-chambers B, B occupy the entire lower part of the refrigerator, and the ice-chamber C substantially the entire upper part of the refrigerator. The provision-chambers are separated from each other by a partition *a*, which extends from the bottom of the provision-chamber up into the ice-chamber to the lower surface of the ice-rack. Inasmuch as the inventor expressly refers in his claim to the provision chambers in the plural, and indicates such chambers by two letters B, B, it seems that both of these chambers are essential to the claim. It is true that in two places the inventor refers to the chamber in the singular. They are never referred to in the singular in the descriptive parts. He suggests but one modification of construction with reference to the partition, and that modification consists in extending the partition *a* up to the top of the ice-chamber, thereby dividing the ice-chamber into two compartments and making two independently operating refrigerators. We do not find anything in the specification tending to broaden the claim in respect to the provision-chambers, and even if such provision had been contained in the specification, it would not, under the decisions, broaden the claim. The inventor is re-

quired by the statute to state clearly and succinctly in his claim what he designs to secure by his patent, and he is bound by such statement.

Not only must there be two provision-chambers, but such chambers must be entirely separated, if the inventor is bound by the description contained in his specification. In the fifth paragraph of the specification, on page one, the inventor says:

"The provision-chambers are separated from each other by the perpendicular partition *a*, which is composed of wood, sheet metal, or other suitable substance, and extends from the front to the rear of the provision-chamber, and from the bottom thereof into the ice-chamber."

In the ninth paragraph of the specification the partition is again referred to as follows:

"The lower edges of the bottom boards x and y are equidistant from the perpendicular partition *a*, which extends into the ice-chamber a few inches above the gutters Z, Z."

In the third paragraph, on page two, the inventor suggests that the partition *a* may be extended up so as to divide the ice-chamber. No other modifications are suggested in regard to the provision-chambers or the partition *a*. Hence two entirely separated provision-chambers are essential to the claim.

The ice-chamber is mentioned in the singular number in the claim. It is an ordinary ice-chamber, and it enters into the claim as an essential feature.

The rack c' is a *rack*, and we think an imperforate table would not be its equivalent. The inventor says in the second paragraph, page 2, as follows:

"c' is a movable rack or open-work platform to hold the ice, consisting of narrow strips of hard wood or other suitable substance, screwed or otherwise secured to transverse strips of wood or other suitable material with open spaces between, so as to allow the air to reach the ice from all directions.

A "rack" as defined in the lexicons, is an open-work frame and not an impervious table, and it is such a rack that the inventor claims. In order that there may be no mistake as to what he claimed he specifically describes it. First, he calls it the "rack" or "open-work platform." He then describes it as "*consisting of narrow strips*" "*secured to transverse strips of wood*" "*with open spaces between.*" The air cannot "impinge" upon the bottom of the ice in a refrigerator provided with an impervious ice-support.

That only an open rack is intended is evident from the last paragraph on page one, where it is stated that the deflector plate K, is so arranged as to allow the drip from the ice to fall on the bottom boards clear of the spaces d. d. And also in the fourth paragraph on page 2, where the plate K is abridged so as not to cover the recess S, S, evidently the word "not" is omitted from the last line of the paragraph.

There is no suggestion of an impervious ice-table, and no provision for deflecting water condensing upon the under side of the ice-table. And if the ice-table were impervious as in the defendant's refrigerator, there would be no condensation on the ice-table above the deflector for the reasons hereinafter stated.

Hence an impervious ice-table is not a mechanical equivalent of the ice-rack c', and Hambrook has limited himself to an open work platform or rack. The "double-inclined bottom pieces x and y, provided with a central opening" are material elements of the invention. This is self-evident, and is not disputed. The only question of difference arises out of the meaning of the term "double-inclined bottom pieces."

In the specification the inventor describes these pieces as entirely separated from each other by the central opening, and extending from "front to rear" of the box. (See 8th paragraph, page 1.) The incline is described as follows: "The bottom pieces x and y incline sufficiently towards the center," etc. The parts designated as x and y are referred to no less than seven times in the specification as bottom pieces, and four

times as bottom boards. They are clearly described in the specification as two independent pieces; are shown as two independent pieces in the drawings; and claimed as independent pieces in the claim.

They are double-inclined, not a single-inclined piece. The inclines are in opposite directions, so as to carry the water towards the center. The specification says x and y "incline sufficiently towards the center." They are claimed as "double-inclined" in the claim.

The specification reads:

"*The lower edges of the bottom boards x and y are equidistant* from the perpendicular partition *a, which extends into the ice chamber a few inches above the gutter Z, Z.*"

The inclined bottom pieces do not meet and the partition separates the openings from each other as well as separates the chambers.

"The double-inclined bottom pieces x and y" each have an independent incline; and the two bottom pieces, entirely separated from each other, are not mechanical equivalents of a single bottom piece having a central opening of less length than the width of the ice-chamber, and inclining, if at all, toward one side of the refrigerator. The claim is specific, and the double bottom pieces with double inclines are made material by the very wording of the claim.

The plate K guards the central opening. The function of this plate K is simply to guard this opening and receive the water which drips from the melting ice through the open rack c'. The opening extends from front to rear of the ice-chamber, and the plate must therefore reach from front to rear, except in the modified form referred to in paragraph four, on page 2, of the specification. This plate has only the function of dividing the water which drips from the rack. The movement of the air currents is in no way controlled or modified by it, and there is no legitimate combination between it and the air passages C, C, or either of them. The claim is merely an aggregation and not a valid combination.

The claim refers to the troughs Z, Z in the singular, also to the air passages C, C in the singular. Unless the inventor intended to claim one-half of the refrigerator divided on a line through the center of the partition *a*, the combination is incomplete; and, if so intended, then the double inclined bottom pieces, x and y, do not constitute a part of the combination, and the claim is inoperative and void, as being a mere aggregation.

The troughs Z, Z are made necessary elements of the combination. Inasmuch as the double-inclined bottom pieces are material elements and central openings are provided for, there must necessarily be two of these troughs to complete the combination, and these troughs are in addition to the inclined bottom pieces. A refrigerator that does not have the double-inclined bottom pieces does not infringe the Hambrook patent. A refrigerator that does not contain the troughs Z, Z does not infringe the Hambrook patent.

The file wrapper and contents of the Hambrook patent shows that the inventor believed that he had made an invention in the circulation of air and in the method of supporting the ice on the open rack so that the air would impinge upon all sides of it, and three claims were drawn to cover the supposed invention. The three claims were all rejected and the rejection acquiesced in by Hambrook. A claim containing no less than nine elements in the combination and most limited in form, was finally passed by the patent office.

Defendant does not Infringe.

If we examine the defendant's refrigerator we find it constructed very differently from the Hambrook refrigerator.

First. It does not contain the open ice-rack c', but uses an impervious metallic table. Neither water nor air can pass through this ice table, so that no water dripping from the ice

can fall on a deflecting plate. This ice table is set upon an incline, which carries all the water away from the melting ice direct to the rear of the ice-chamber.

The so-called deflector plate in the defendant's refrigerator is merely a flat piece of zinc beneath the ice table over the opening to prevent the condensation of water at that point on the ice-table and not to deflect water running through the ice-rack. It is not used for the same purpose nor in the same combination, nor in any combination except with the ice-table and ice-chamber.

The zinc strip in the defendant's refrigerator is not curved but perfectly flat. It is not a deflector, for it deflects no water either from melting ice or from condensation. It merely prevents the warm outside air from coming in contact with the ice table at a point over the central opening into the provision-chamber. It is attached to the under side of the ice-table and in close proximity thereto, and is an exact equivalent of the wooden center piece of the Smith patent of July 24, 1887. (See Fig. 2 of Smith patent).

See testimony of George R. Hotchkiss, Record p. 229-230
" " John C. Martin, " p. 241.
" " Levi Scofield, " p. 296.
" " Arthur W. Ranney, " p. 248.

Complainant's witness, James W. Nye, R. 47, Ans. 30, says: "It (the zinc strip) is designed to prevent condensation in that particular spot." (See also page 53). This witness also points out the defect in the Hambrook refrigerator. (See R.).

The flat zinc strip in defendant's refrigerator, according to complainant's expert witness, cannot be used in connection with an open ice-rack like the rack in the Hambrook refrigerator, for this reason: It being flat, the water from the ice would run over the edges, would follow along the under surface of the strip and drop into the provision-chamber. The Hambrook has no pitch from front to rear.

Complainant's expert, M. R. Dayton, was also of the opinion that such would be the case with the defendant's ice-table, which is corrugated and has a decided incline. In this latter opinion we believe he was mistaken; but there would certainly be a drip from a flat, horizontal surface if any water should fall on its upper surface.

The circulation of the air and the operation of the refrigerator would be precisely the same without this strip as with it. It merely prevents the condensation of a few drops of water upon that part of the ice-table immediately above it, when the door of the refrigerator is opened. It is not connected to the central partition, as defendant has no partition extending into the ice-chamber; and if the central partition in the defendant's refrigerator should be extended through to the ice-chamber, as suggested in the Hambrook patent, it would destroy a refrigerator constructed like defendant's.

The defendant's refrigerator does not contain an ice-chamber having "double-inclined bottom pieces x and y" nor any double-inclined bottom, but on the contrary contains a plain, simple, flat bottom, inclining from front to rear of the refrigerator in a uniform slant or incline. The slot or opening in the bottom of the defendant's refrigerator does not extend from front to rear so as to separate the bottom of the ice-chamber into two parts, but extends about two-thirds of the distance by actual measurement. The bottom is a single and not a double bottom, and has a single and not a double incline.

If the Hambrook has any novel feature it is found in the partition *a*, which extends into the ice chamber, dividing the cold air opening into two separate openings, one on each side of the partition, making in effect two independently operating refrigerators.

A comparison between the refrigerator described in the Hambrook patent and the defendant's refrigerator will show that defendants refrigerator does not contain the combination of the Hambrook patent.

Hambrook Patent.	Defendant's Refrigerator.
1. Ice-chamber.	1. Ice-chamber.
2. Double-inclined bottom pieces.	2. Single flat bottom.
3. Two troughs, Z, Z, extending from front to rear of refrigerator.	3. No troughs, Z, Z, but upturned flange around an opening in the bottom of the ice-chamber, which opening does not extend either to the front or rear of the chamber.
4. Partition *a* expressly described as "extending into the ice chamber."	4. Partition not extending up to the bottom of the ice-chamber.
5. Waste water pipe at front of refrigerator.	5. Waste water pipe at rear of refrigerator.
6. Open rack to let water and air pass through.	6. Imperforate ice-table, through which neither water nor air can pass.
7. Curved deflector plate to receive the water which drips through the ice-rack and prevent the same from dripping into the provision-chamber.	7. Flat strip of zinc to prevent condensation on the under side of imperforate ice-table.
8. Two cold-air flues, separated by partition *a*, which extends into the ice-chamber.	8. Single cold-air flue.
9. Warm-air flues.	9. Warm-air flues.

Even if the Hambrook patent were valid, defendant does not infringe.

A comparison of defendant's refrigerator with the Alaska refrigerator will show how closely they resemble each other.

Alaska Refrigerator.	Defendant's Refrigerator.
1. Ice-chamber.	1. Ice-chamber.
2 Flat bottom to ice-chamber.	2. Flat bottom to ice-chamber.
3. Central opening with upward extending flange.	3. Central opening with upward extending flange.
4. Partition not extending to ice-chamber.	4. Partition not extending to ice-chamber.
5. Waste water pipe in rear of ice-box.	5. Waste water pipe in rear of ice-box.
6. No troughs *z*, *z*.	6. No troughs *z*, *z*.
7. Flat strip of wood over central opening.	7. Flat strip of zinc over central opening.
8. Warm-air flues extending to top of ice-chamber.	8. Warm-air flues opening near top of ice-chamber.

The operation and movement of the air is the same in both refrigerators.

If the defendant's refrigerator infringes the Hambrook refrigerator, then the Alaska anticipates the Hambrook.

Aggregation.

The Hambrook specification calls for two forms of refrigerators: One with the partition *a* extending into the ice-chamber and up to the ice-rack, dividing the cold-air flue, and dividing entirely the lower part of the refrigerator into two provision-chambers.

The other form extends the partition *a* to the top of the refrigerator, dividing the refrigerator into two separate and independently operating refrigerators.

Every element of the Hambrook patent was old and its mode of operation was old.

1. Provision-chamber, double and single, is found in the Smith patent, the Law patent, the Sanford patent, and others.

2. Ice-chamber in all respects like the ice-chamber of Hambrook is found in all the older refrigerators.

3. Ice-racks, open, solid, and corrugated, are found in refrigerators from 1852 down.

4. Double-inclined bottom pieces like *x* and *y* are found in the Law, Sanford, Rohrer, and the Fisher refrigerators, and complainant's experts find the same in the Alaska and in the Page patents.

5. Single-inclined bottom pieces are found in the Lyman, Chase and many other refrigerators antedating the Hambrook.

6. Deflector plates are found in the Page, Koch, Smith and Lyman and many others.

7. Two warm-air flues; one at either side, are found in the Law, Smith, Rohrer and numerous others.

8. Cold-air flues are found in the Smith and Lyman, and nearly all the earlier refrigerators.

9. Troughs and waste-water pipes are shown in the Lyman and various other refrigerators.

All this was admitted by complainant's expert, who makes the following admission: (C. Q. 29 R., 90.)

"Q. 29. Is it not a fact that refrigerators were constructed a long time prior to the Hambrook invention, containing substantially the same air passages and operating in substantially the same way as the Hambrook invention? I refer particularly to the movement of the air from the ice-chamber down into the provision-chamber, and the rising of the warm air from the provision-chamber to the ice-chamber.

"A. It is.

"Q. 30. Does the Hambrook patent cover any new element or is it simply a combination of old elements, which elements were well known in refrigerators?

"A. I think all the elements of the Hambrook refrigerator, considered individually and generally, were old, and the Hambrook patent presents only a new form of combination and arrangement of old elements, which, as he combines them, presents a structure that, as a whole, is new."

Expert witness Dayton says that the flat plate is an equivalent of the Hambrook deflector K (R. 88); and that the wooden strip would be an equivalent (R. 89).

Cross-questions 26 and 27 (R. 88) describe exactly the construction shown in the Smith patent, and Dayton says that such construction would be the equivalent of the Hambrook deflector. He even says that an upturned deflector, which would make a trough, would be a mechanical equivalent of the Hambrook deflector K, as shape has nothing to do with it (R. 90, A. 27).

Witness Dayton points out that a flat plate will answer the purpose of a curved plate (R. 89); that wood would be suitable for a deflector plate. That a wooden strip placed beneath the flat metallic ice-table would be an equivalent of the Hambrook deflector plate; that the form of the deflector plate was immaterial. He also finds in the Koch patent a deflector plate similar to the deflector plate in the Hambrook patent.

In the Yost patent he found a deflector plate and also the partition. In the Page patent he finds a deflector plate. He says the bottom of the ice-chamber with its upturned edges is almost identical with the same parts in the defendant's refrigerator, (C. Q. 50, R., 147). He admits that the deflector plate in the Page patent performs the same function as in the Hambrook patent. He finds two inclined bottom pieces in the Law patent (R., 131). He finds the side flues in the Rohrer patent (R., 145). He says the Law patent contains double-inclined bottom pieces, the two side passages, and the central opening, substantially the same as the corresponding parts of the Hambrook, (R., 148). The Chase patent shows one of the inclined bottom pieces and a trough exactly like trough *z* of the Hambrook patent (C. Q. 68, R., 150.) He finds all the elements of the Hambrook patent in the Smith patent, except the deflector plate K and the small deflectors *e*, *e*.

His testimony in regard to the Smith patent would show that he found the deflector plate in the Smith patent; that is, he says a flat piece of wood over the central opening beneath the flat metallic ice support would be the equivalent of the Hambrook deflector, and that is precisely what Smith shows in his patent. After summing the whole up Mr Dayton says:

"I think all the elements of the Hambrook refrigerator considered individually and were generally old."

He also admits, repeatedly, that the movement of the air and general principle of operation of the Hambrook was old.

Complainant's expert R. D. O. Smith, says if the Smith patent did not contain the obstruction caused by the long upturned air passage "this invention must have anticipated Hambrook." This is equivalent to saying that every element of the Hambrook patent was old except the deflectors *e*, *e*, which witness says are not elements of the Hambrook claim. Smith thinks that the Hambrook invention consists in removing the obstructive features of the old refrigerators, and shows more intelligence than any of them. He practically finds in the Lyman patent all the elements of the Hambrook invention. In answer to C. Q. 69 (p. 179), he says:

"Well, I think if from the Lyman refrigerator, the duct which he designates by the letter F, were removed, and which I understand by your question to be contemplated in the words "aside from the impediment," I think it would be very well adapted, and almost equal to the Hambrook device. It would be quite equal to it if said duct were removed, and a warm-air opening in the ice-chamber was also removed further from the roof."

This witness finds that the Lyman refrigerator, as actually made, was the full equivalent of the Hambrook refrigerator; and as the witness supposes it was made, he finds all the elements contained in the Hambrook claim. In the Chase he finds an inclined bottom, a rack and the trough *z*. In the Rohrer he finds a warm-air passage. In the Page he finds a deflector plate, the central opening, the double bottom to the ice-chamber, all performing the same functions as the corresponding parts in the Hambrook. He repeats that Hambrook introduced no new features, and that the circulation is substantially the same as in the older devices. Both experts testify that the deflector plate *K* has no effect to accelerate or retard

the movement of the air. The experts also admit that in one form, at least, of the refrigerator as made by Hambrook, one-half of the refrigerator is entirely independent of the other half.

Let us consider the form of the Hambrook patent which has the partition *A* extending up so as to entirely divide the refrigerator into two independent devices, and there is not one element on one side of the partition that co-operates with an element on the other side of the partition. We can shut up the cold-air flue on one side of the partition; the warm-air flue on that side; remove one of the troughs *Z*; take out the entire ice-box, and still the other side will operate in all respects the same as it would before the removal of such parts. There is no co-operation between the two halves of the refrigerator. It is merely an aggregation and matter of convenience, and not a matter of operation. It is two Lyman refrigerators placed side by side. The same is practically true in the other form described in the Hambrook patent, where the partition only reaches the ice-rack, in which case it entirely separates the provision-chambers and partially divides the ice-chamber. The removal of one-half of the deflector K will not in the least affect the amount of the air currents. Complainant's experts admit this. The shutting up of one half of the refrigerator would not affect the operation of the other half of deflector *K*. The entire removal of deflector *K* will not in the least affect the volume or flow of the air currents. Complainant's experts admit this. The shutting up of one ice-chamber would not affect the operation of the other ice-chamber. The cold-air flues are separate from each other, so that one cannot co-act with the other, and if we should close up the warm-air flue and the cold-air flue on one side of the refrigerator, the other side would work equally as well.

Even upon the theory of complainant's expert, that the parts had never before been arranged or combined, as they call it, in the same manner as shown in the Hambrook patent, the arrange-

ment or combination is merely an aggregation and does not amount to invention.

Hales *vs.* Van Wormer, 20 Wallace, 268.

"Combination results are not necessarily novel results. Nor are they an old result obtained in a new and improved manner. Merely bringing old devices into juxtaposition, and there allowing each to work its own effect without the production of something novel, is not invention."

Deere & Co. *vs.* J. I. C. Plow Co., 65 O. G., 441.

History of Hambrook Refrigerator.

Was the Hambrook refrigerator a success?

Before the Complainant purchased the business and the Hambrook patent, the history of the manufacture of the so-called Hambrook refrigerator is divided into three periods.

1. R. T. Hambrook Company manufactured refrigerators like the drawings of the patent from some time early in 1878 until October, 1882, (R., 78, 83, and 98).

2. The Booth & Osgood Company manufactured refrigerators of the same pattern from October, 1892, until the failure of the company and the appointment of a receiver November 14, 1883, (R., 59). The receiver, William A. Stanton, manufactured from November 14, 1883, until about August 5, 1884, when, he sold out the entire business to one James W. Vale. The complainant company was organized October 27, 1884; bought the assets of the Booth & Osgood Manufacturing Company, which Vale had purchased of the receiver, and proceeded to manufacture an entirely different style of refrigerator.

During the time that the Hambrook Company manufactured these refrigerators they made, according to the estimate of Mr. Lewis, three or four thousand (R., 110) about two-thirds of

which were constructed with a single bottom, or like one-half of the Hambrook refrigerator, which form complainant admits would not be covered by the Hambrook patent.

About the same number were made by the Booth & Osgood Company. They were all made like the drawings, excepting those that had the single door. Those with the single door had but one warm air and one cold air flue (R. 113 and 114); or, in other words, they were just one-half of the double refrigator, (113 C. Q. 113). The witness Lewis, who is Vice President and General Manager of complainant Company, thinks the Hambrook Company and the Booth & Osgood Company must have made ten thousand refrigerators altogether, (C. Q. 11 R. 109). He seems to add from two to four thousand to the other estimates. He refers to no books, merely makes a guess. I we give him the full benefit of the largest number, it is less than two thousand refrigerators a year, and two-thirds of these were not covered by the Hambrook patent; that is, the single door refrigerators were not (according to the complainant's expert Dayton) Hambrook refrigerators. So that this invention, which complainant insists is so immensely valuable, did not for five years get even a respectable showing on the market; did not average seven hundred a year, and, as a consequence, the business went into the hands of a receiver. The receiver, William A. Stanton, ran the business until he sold to Vale.

He says (R. 60 Q 9).

"I can't tell exactly how many refrigerators I sold as receiver, but think it was about sixteen hundred."

In another place in his testimony, without making reference to any memorandum, he thinks he sold a good many more. The refrigerators made by the receiver are claimed to have contained a flat bottom to the ice-chamber substantially like the Alaska refrigerator. One or two flat bottom refrigerators were made in Chicago while George R. Hotchkiss was in the employ of the Booth & Osgood Company. They were made just be-

fore the failure of the Company and none were sold. George R. Hotchkiss says that he made one for the receiver in the fall of 1884, just like the "New Perfection" (240). The New Perfection is the style of refrigerator now made by complainant.

John C. Martin (R. 242) corroborates Hotchkiss in regard to this refrigerator, and says that he lined the refrigerator with zinc. This refrigerator was copied from the Alaska, as appears by the testimony of both Hotchkiss and Martin.

The complainant's witnesses testified that two flat bottom refrigerators were made before the failure of the Booth & Osgood Company. John Lewis (R. 81) says the first flat bottom refrigerators were made in 1881 or 1882. This he afterwards corrects and places it in the fall of 1883. Complainant's witness, Charles Lund (R. 97), says he first saw "flat bottom ice-chambers in September or November, 1883." Complainant's witness, Victor Lund (R. 101), says there were a few patterns with the flat bottom. "Old Mr. Osgood, he worked on that pattern and I helped him occasionally." "Old Mr. Osgood he claimed that they were his own invention."

Complainant's witness, P. B. Sheridan (R. 103), says:

"Mr. Osgood made two flat-bottom boxes." (Q. 21.)

John Lewis (R. 105), correcting his former testimony, says the flat-bottom boxes were made in the fall of 1883, but not put on the market till 1884. No witness, either of complainant or defendant, refers to the flat-bottom refrigerators as Hambrook refrigerators. It does not seem to have occurred to them that the flat bottom was constructed in accordance with the Hambrook patent. It is not material who first copied the Alaska refrigerator.

Defendant's witness, George R. Hotchkiss, acted as traveling salesman for the Hambrook Company and the Booth & Osgood Company, and he testifies that the Hambrook refrigerator was a failure. John C. Martin, who was foreman in

the tinning or lining department, testifies to the same, and he says that the defect was caused by the dampness which gathered on the troughs z, z and on the water basin S, and dripped into the bottom chamber, and that he was called upon frequently to repair or try to repair the difficulty.

A. W. Ranney was told by the officers of the Belding Company that the Hambrook refrigerators would sweat or condense.

In 1885 John Lewis, vice-president and manager of the complainant corporation, told defendant's witness, Levi Scofield, that the Hambrook refrigerator was a failure. The admission made to defendant's witness, Scofield, stands undisputed.

An examination of the construction of the Hambrook refrigerator as shown in the specification, discloses the very defects pointed out by defendant's witnesses. The trough z, z and the catch basin W is filled with ice-water. If warm air is brought in contact with the surface of these troughs, moisture would gather and drip into the provision chamber. There is nothing whatever in the Hambrook construction to prevent it, and complainant's expert witnesses were quick to point out this defect in the Law Patent, but were unable to see that a trough filled with ice water in the Hambrook patent would produce the same result. The best proof, however, that the Hambrook refrigerator was not a success is found in the admitted fact that after more than five years' trial the construction was abandoned.

The complainant copied the Smith refrigerator, commonly called the Alaska patent 193,563, reissue 8463, and they abandoned the Hambrook construction.

The Hambrook refrigerator provided for large air passages in order to keep the temperature of the whole refrigerator as nearly uniform as possible. The Alaska provided a large ice chamber, a small central opening, a narrow space below the ice support, and depended for its success upon holding the air in the ice chamber until the same would become thoroughly refrigerated.

The inventor referring to this construction says:

"This construction is deemed important, as thereby not only a large chamber is provided for the reception of the ice, but in this chamber there is room for the refrigeration of a large body of air, and the outlet for the discharge of this air in the provision-chamber being small, all the air is detained in the ice-box chamber until it is perfectly cooled."

The plan and arrangement of the Hambrook refrigerator was to give a free passage for the air. The plan and arrangement of the Smith refrigerator was to give a very large ice-chamber, a small space between the ice-support and the bottom of the ice-chamber, and a small indirect opening through such bottom, thereby detaining the air in the ice-chamber in order to insure thorough refrigeration before it was passed into the provision-chamber. The complainant adopted the plan of the Alaska refrigerator and not the plan of the Hambrook.

The complainant made its first refrigerator in the year 1884. It discarded the "double-inclined bottom pieces" of the Hambrook patent and adopted the single flat bottom of the Smith refrigerator. It discarded the trough z, z; discarded the open ice-rack; removed the waste-water discharge pipe to the rear of the ice-chamber; enlarged the ice-chamber; it used a small single cold-air opening into the ice-chamber; shortened the center partition so as not to divide the cold-air opening; it caused the air to travel in a circuitous route in order to pass from its entry in the ice-chamber to its entry in the provision-chamber, and, in fact, adopted substantially the Alaska construction. This was undoubtedly done for a purpose.

Compare the complainant's and the defendant's refrigerators with the Hambrook patent and with the Smith or Alaska patent, and it will readily be seen that neither the complainant nor the defendant constructed a refrigerator which resembles the Hambrook patent as nearly as it resembles the Alaska refrigerator. The Alaska refrigerator was a competitor of the defunct Booth & Osgood Company, and was the most popular refrigerator on the market.

George R. Hotchkiss began selling the Alaska refrigerators in 1879, and afterwards sold refrigerators for the Hambrook Company and the Booth & Osgood Company, and was employed by the complainant company even before the articles of corporation were signed. He was sent to Belding to oversee the making of complainant's first refrigerators.

Complainant's witness, William A. Stanton (R. 159), says:

"The reason that we sent Mr. Hotchkiss to the factory was that we had nothing for him to do here, and knew that he understood when the goods were made right."

Hotchkiss says he went to Belding with the understanding that he was to make just such a refrigerator as he wanted to, and that he took drawings with him from Chicago (R. 227); that he had "refused under any condition to go into that company if they were to manufacture the Hambrook refrigerator." He further says (R. 228):

"They told me they did not intend to manufacture the Hambrook refrigerator. This refrigerator which I built was taken largely from the Alaska in its internal arrangement of the flues; the inside of it was similar to the Alaska. The only difference there was between that refrigerator and the Alaska was, I took the warm air in at the ends of the ice-chamber near the top, while the Alaska took it through the lid and discharged it through the center of the lid, otherwise it was similar to the Alaska, in construction, in every way."

The Alaska refrigerator was very popular, and witness considered it the best refrigerator built (R. 232).

Defendant's witness John C. Martin (R. 241) says he lined a refrigerator for Mr. Hotchkiss like the Alaska, in Chicago, in 1884.

"I was instructed by Mr. H. H. Belding to work under Mr. Hotchkiss' orders and do as he told me. I am acquainted with the Alaska refrigerator (R. 242). He copied the Alaska because it was a better refrigerator than the Hambrook."

The witness shows that he went from Chicago to Belding and was instructed to work under Mr. Hotchkiss (243).

The Alaska refrigerator was and is a popular refrigerator, and its sales are larger than any other refrigerator in the country.

Defendant's witness A. W. Ranney, says he was acting as foreman of the complainant's factory in the fall of 1884 (R. 243); that Hotchkiss was sent to over see the first refrigerator. (R. 248).

"I had my instructions at the machine shop to make them just as Mr. George R. Hotchkiss ordered."

The witness agrees with Martin and Hotchkiss in regard to their construction.

Complainant's witness Stanton, admits (R. 62) that the Alaska Company sold more refrigerators than the Belding Company.

Hiram H. Belding (R. 46) substantially admits that complainant's refrigerator is the same as the Alaska.

Levi Scofield, the superintendent of defendant's factory, called at complainant's factory in August 1885 ; curefully examined the factory and talked the matter over with Mr. E. T. Ranney, then superintendent, and Mr. Ranney stated to Mr. Scofield as follows (R. 292):

"We originally manufactured the Hambrook refrigerator, also the Booth & Osgood refrigerator, but we have made an entire new refrigerator outside and in, which we call the New Perfection. The reason why there is no patent mark placed on them I cannot tell, unless it is because they are not patented, as they are certainly very different from the original Hambrook refrigerator. He was very decided in his answer to this question, and in some further remarks he said that the Hambrook refrigerator had proved a failure and busted up two companies."

Mr. Schofield further testified :

"My sole object in asking these questions was to ascertain

if the Belding Manufacturing Company claimed to be manufacturing this refrigerator under any patents. This enables me to be positive in what I say, as we had fully determined not to manufacture any refrigerator whereby we might get into patent litigation."

Mr. Schofield further states that Mr. Ranney repeated his statement that the Hambrook was worthless. He further testified (R. 293):

"I asked Mr. Ranney what difference there was between the New Perfection refrigerator and the Alaska refrigerator, they being very similar in appearance.

"He explained there was practically no difference, as the Alaska took warm air into the ice-chamber at the top, while the New Perfection took it in at the ends in two places instead of one as in the Alaska."

Not one of the refrigerators at that time contained a patent mark of any kind. This testimony of Mr. Scofield was not disputed in any way, although complainant took rebutting testimony.

The testimony and the Alaska patent show conclusively, that whoever suggested the complainant's refrigerator called the New Perfection, whether Mr. Hotchkiss or Mr. Osgood, it was copied from the Alaska refrigerator and not from the Hambrook.

Patent Mark.

In August, 1885, Mr. Scofield could find no patent mark. Mr. F. E. Ranney, complainant's superintendent, told him that they were not marked "patented" because they were not patented.

Witness Hotchkiss testifies that no mark was put on them until late in 1885 by complainant.

John C. Martin, who had every opportunity to know, testifies to the same effect.

Arthur W. Ranney, who in 1884 and 1885 acted as foreman, testifies to the same effect.

Sidney W. Brown, who worked in the packing-room and saw all the refrigerators that were made, says:

"No patent mark was put upon the refrigerators until December, 1885."

He says (R. 256) the old stencil read: "New Perfection, manufactured by the Belding, Mfg. Co., Belding, Michigan." After that time they got a new stencil which read: "New Perfection, manufactured by the Belding Mfg. Co., Belding, Michigan, patented May 28, 1878."

This witness fixes the date when the new stencil was procured by the fact that it was some time after the company put in their new boiler, which was put in in the fall of summer of 1885.

John Lewis, assistant treasurer of complainant, testifies that the complainant did put in a new boiler in 1885 (R. 106), and when asked if a new stencil was purchased for use at the factory in Belding, in December, 1885, or about that date, he answers, "I don't remember."

If complainant marked any refrigerators before late in the autumn of 1885, it would have been easy for it to have proved it. The books of the company would doubtless show when the stencil was purchased, as well as the date of sale of refrigerators, but no refrigerator made prior to December, 1885, could be found by defendant containing any patent mark, and complainant failed to produce any such refrigerator. No witness engaged in its factory in packing, stencilling, marking or crating, or who had anything to do with the refrigerators was produced to rebut the testimony on this point. There is no evidence to show that complainant had any stencil with which it could mark the refrigerators "patented," until December, 1885.

The Hambrook patent was considered of so little value that it was not inventoried by the receiver, Stanton, and the first order of sale did not even refer to it. The complainant did not record its assignment until December 17, 1885; doubtless at the very time it decided to stamp its refrigerators "patented," in order to make the claim that the defendant was infringing.

In view of the overwhelming testimony given by the defendant, and in view of the fact that complainant could easily have shown that it marked refrigerators "patented" prior to December, 1885, and failed to do so, the evidence seems conclusive that no patent mark was used until that time, and that complainant did not suppose up to that time that it was manufacturing refrigerators under the Hambrook patent.

Complainant's Experts.

The bulk of complainant's evidence consists in the oral testimony of M. E. Dayton and R. D. O. Smith.

Dayton found as elements of the claim of the Hambrook invention (R. 36):

1. Provision-chamber or chambers.
2. Ice-chamber.
3. An ice-rack.
4. Double-inclined bottom pieces, x and y.
5. Deflector plate K.
6. Two warm-air passages c, c, one at each side.
7. Central opening.
8. A trough z, double or single.
9. A pipe z'.

He notes the fact that the claim reads in the plural, in speaking of the chambers b, b, but he reads the plural out of the invention. "Double-inclined bottom pieces," although the claim makes "double-inclined" a compound word, this ingenious expert makes the part of the word "double" apply, not to the inclined, but to the central opening, and explains how the Hambrook invention covers the perfectly flat bottom

all in one piece, with a central opening not dividing the bottom into two parts, but extending scarcely two-thirds its way. (R 38) he says:

"I also do not fail to notice that the deflector plate which answers to the deflector plate K of the patent is, in defendant's refrigerators, a flat plate instead of a curved one."

But the expert finds this an equivalent of the curved deflector. He says:

"The essential thing is the place which this deflector occupies," and he ignores the fact that defendant does not need a water deflector, but merely a flat strip to prevent condensation, as there can be no dripping from the impervious ice-support of the defendant's refrigerator.

On cross-examination (R. 88) he says the double feature of the bottom of the ice-chamber is essential. It must be so as to leave practically two bottom pieces, x and y. (R. 87) he says: "The claim distinctly calls for two bottom pieces, x and y." The location of the central opening he finds material (87); and also a plurality of warm-air passages c, c.

In the modified form suggested by Hambrook, the removal of one-half would destroy the combination of the Hambrook patent (C. Q. 16). He admits that one-half of a Hambrook refrigerator will operate as a complete refrigerator (R. 88). An open rack he finds not material, although without the open rack the deflector K has no function in the Hambrook refrigerator. A wooden strip would be the equivalent of the deflector K (R. 89). It would be even if used in connection with a flat ice-table (90). This is precisely what is shown in the Smith patent.

He concedes that before the Hambrook invention, the same mode of operation, and substantially the same parts, were all known. He says (R. 90), "I think all the elements of the Hambrook, considered individually and generally, were old."

Mr. Dayton being called upon rebutting, limits the Hambrook patent as follows (R. 120):

"In other words, the Hambrook patent is not broadly for the idea or discovery that cold air is heavier than warm air and will fall by its greater specific gravity and thus cause the warm air which it displaces, to rise; nor is it for the general location of an ice-chamber above a provision-chamber by which the difference in specific gravity between the cold and warm air may induce a circulation; nor is it for a particular form of grate or support on which the ice may rest while allowing air to move downward in contact with the ice; nor is it for the idea of inclining a water shed in order to permit water to flow therefrom; nor is it for the provision of an air passage broadly, by which air may descend from the ice-chamber, or ascend from the provision-chamber. All these things, broadly considered, were well known in various forms at the date of the Hambrook invention."

He then finds that the Hambrook invention consists in delivering "dry air" into the provision chamber (R. 120), and proceeds to consider the patents set up as anticipations, and comment thereon. He says the Butler patent has no top lid (134), and the water cooler is not a deflector.

In the Koch patent he finds a deflector.

In the Smith or Alaska patent (135) he finds all the elements of the Hambrook except the deflector, and the warm-air uptakes do not discharge into the sides of the ice-box. This is an admission that the warm-air uptakes, as he calls them, differ only in form from the Hambrook; and this same expert in another part of his testimony found the flat wooden strip beneath the metal ice-support, exactly as shown in the Smith patent, to be a full equivalent of the deflector K. He does not attempt to explain why a flat strip in the defendant's machine is a deflector K and not in the Smith machine. He says (R. 126):

"The water from the ice will be carried by the air current and drip into the central opening in the Smith patent."

He had just stated that the friction of the air in the long warm-air uptakes would almost prevent circulation. He first finds that Smith destroys the air current, and then finds that he

has an air cnrrent strong enough to carry drops of water a considerable distance—much further than it would be necessary to carry them in either complainant's or defendant's refrigerators, for the reason that the flat deflector in the Smith or Alaska patent is much broader than in the defendant's or complainant's refrigerators.

He finally closes his testimony in regard to the Smith patent as follows (R. 153, C. Q. 84):

"Is not the bottom of the ice-chamber in the Smith refrigerator, having a center opening and an upturned flange around said center opening, almost identical in form and structure with the corresponding part in the defendant's refrigerator?

"A. It is; and it is in my judgment the full equivalent of the corresponding part of the Hambrook patent."

The witness finds a deflector K in the Koch patent. He says, in a broad sense, the Banta patent contains the air circulation common to all refrigerators (144), and admits that the air descends in a cold state into the provision-chamber (145); but thinks the water from the melting ice would impart a moisture to this air.

He finds the Law patent defective in having a trough instead of a deflector (148). He admits that the general construction of the Law patent is the same as the Hambrook. He says (148 C. Q. 53):

"Does not the Law invention contain the double-inclined bottom pieces, the side air passages and the central opening, substantially like the corresponding parts of the Hambrook invention?

"A. It does."

He thinks that it is the upturned edges of the Law patent that obstructs the free movement of the air. He does not attempt to show why the upturned flange in complainant's and defendant's refrigerators does not obstruct the free passage of air. The air, he says, descends with the water in the Law refrigerator, and is not dry (149). He explains that the trough

in the Law patent is filled with ice-water and a contact of the air with the lower part of this trough will condense drops of water.

In regard to the Lyman patent (138) Dayton says:

C. Q. 4. "Does not the Lyman patent of 1856 show a construction which gave free and unobstructed passage of the air to the ice-chamber? A. To the extent of the size of the conduit F, this is true."

He says the Lyman structure would not anticipate the Sanford invention. On cross-examination, he finds in the Lyman patent, the inclined bottom, and a trough similar to the Hambrook (139). He thinks the movement of the air will sweep the water as it drops from the deflector *I*, over the opening into the pipe leading into the provision-chamber. He evidently supposes the Lyman refrigerator has a very strong current. He considers the conduit F, the vital feature of the Lyman invention.

He finds one of the inclined bottom pieces and the trough z, in Chase patent (150). He does not find, after a careful review of the whole business, a single new element, nor a new mode of operation, in the Hambrook invention.

R. D. O. Smith says (R. 69):

"At the date of the Hambrook patent it was not new to construct refrigerators in such a way that the coldness of the air would cause a circulation of air through the interior chambers of the refrigerator. I believe from what I recollect of this art, that broadly stated this arrangement was not new at the time of the Hambrook patent, and the patent must therefore refer to some lesser and minor peculiarities."

After enumerating all the parts, substantially as was done by expert Dayton, and admitting that such parts were old, he says:

"And I am therefore compelled to look for novelty into those members of the combination referred to as bottom pieces, provided with central openings, troughs, side passages, and deflector plates."

He reads out one of the provision-chambers mentioned in the claim (70). And again, on cross-examination, he says .

"I do not think either of the elements themselves were new."

The plate K is any plate, regardless of shape or form, placed below the ice-chamber, to prevent water from dripping into the provision-chamber.

His direct testimony is substantially all included in answer to question five. The answer covers five closely printed pages, and was prepared and written out in full by the witness on Sunday, two days before the day set for the taking of his deposition (177).

No objection was raised to the testimony on that account, and this fact is referred to merely to show the care used in preparing the answer by this expert. After rehearsing his former statement that in the main the elements of the Hambrook refrigerator and its mode of operation was not new, he very lucidly states :

"Consequently, no interpretation of this patent can be made on common-sense principles which will render it broad enough to cover what was previously known. * * * With reference to this I feel it proper to say that my understanding is, that an improvement in an article is to be gauged by the public approbation of it. * * * All patents or patentable inventions are based upon known laws, and are exemplified by various uses and combinations of known mechanical powers and appliances, etc."

(167) Thinks Hambrook was the first who comprehended the feebleness of air currents. After pointing out the defects in other refrigerators, the witness says :

"The patent to Smith 195,563, presents the same obstructive features which have before been pointed out. The rarefied air ascends to a passage in the cover, whence it will only descend to the ice by an application of force, and adequate force is not present; otherwise this inventor must have anticipated Hambrook."

This is an admission that the Smith patent contains every patentable invention of the Hambrook, as it would require no in-

vention to turn the air into the sides of the ice-chamber, as was done in the Law patent and numerous other older patents. This admission is contained in answer five, above referred to, and is not the result of a hasty answer to a cross-question.

On cross-examination (171), Smith states that paragraph two of the Hambrook patent contains the essence of the invention. (172) The only defects witness can point out in the Fisher, No. 133,147, is, that the air that enters the ice-chamber too near the roof. The ice-table of the Fisher patent would not materially retard the air circulation. The longer the perpendicular air flue is, the greater would be the obstacle, according to Smith.

He evidently never learned that the greater the height of the tube, the stronger the air current.

The Sanford patent is defective, according to Smith, because the air is compelled to descend nearly to the bottom of the chamber. This, he thinks would weaken the air current.

The Lyman patents witness finds defective in the the length of the cold air flue. In answer to cross-question 69 (R. 179) he says :

"Well, I think if from the Lyman refrigerator, the duct which he designates by the letter F. were removed, and which I understand by your question to be contemplated in the words 'aside from the impediment,' I think it would be very well adapted, and almost equal to the Hambrook device. It would be quite equal to it if said duct were removed, and a warm-air opening into the ice-chamber was also removed further from the roof."

The witness overlooked the fact that Lyman provided for the omission of the duct F, and that the opening for the warm-air into the ice-chamber is at the very point where the witness considered it would be the most effective, to-wit ; about on a line with the top of the ice (R. 187, answer to C. Q. 120). Witness does not know how far below the top of the ice-chamber the warm-air inlet in the Hambrook refrigerator is placed (179). The deflectors e, e, are not essential to the Hambrook inven-

tion (R. 180). (Record 182.) He says the Hambrook patent covers a refrigerator with a single air passage and single trough. He does not seem to be aware that this is precisely what Lyman had previously used. He says (183): "Hambrook is not limited to the number of side passages, nor to the number of troughs, nor to the number of bottom pieces."

He finds in the Chase patent the inclined bottom piece of the Hambrook invention, also a trough the same as trough z. He finds no material difference between the construction of the trough in the Hambrook and Lyman and the Chase. The Chase patent shows a construction which allows the air to pass freely from the ice-chamber to the provision-chamber (183). Says that the ice-chamber, ice-rack and bottom piece, trough and opening from the ice-chamber to the provision-chamber is found in the Chase patent; that they are full mechanical equivalents of the corresponding parts of the Hambrook patent (C. Q. 98). Admits that the air would pass down into the provision-chamber in the Chase refrigerator in a cold, dry state. He also finds double-inclined bottom pieces in the Banta patent He says the Rohrer patent shows a device which allows a very free passage for the upper warm-air currents, but the upturned edges of the troughs would retard the down flow of the cold air. Cannot tell whether the Rohrer shows a larger space in the aggregate than the Hambrook for the down flow of the cold air. (188) Finds the trough in the Law patent to be the obstacle in the way of a free downward flow of cold air. Admits that the Law patent does not say that the upper edges of the trough lap by the bottom pieces, and that they need not be so made.

On page 189, cross-question 138 and answer, gives Mr. Smith's idea of the Hambrook invention.

C. Q. 138. "Do you think the invention of Hambrook consisted in his discovering that it was desirable to have a free movement of the cold-air current, and that such free movement

would be attained by the removal of obstructions, such as were shown in prior patents, where the air was compelled to rise over the trough, as shown in the Law patent?

A. "That is in substantial accordance with the views which I have stated."

He finds some obstacles in the Hunt patent, as in the Rohrer, but admits that the inverted troughs have the same function as the Hambrook deflector.

He defines what would not be the Hambrook invention on page 190, as follows:

C. Q. 150. "In your opinion, a trough with an upturned flange, thereby breaking the air current, compelling the air to rise and pass laterally over the flange or edges of the trough, would necessarily be a departure from the Hambrook invention, would it not?

A. "If it compelled the air to rise and pass over as in the Hunt and Law patents, then it would be an obstruction."

If the defendant has a trough at all in its refrigerator, it is caused by turning the zinc around the central opening of the bottom of the ice-chamber, and the cold air must rise up to pass over this flange before it can descend downward into the provision-chamber, and it would, therefore, present the same obstacle found in the Hunt patent, and others, and would not, according to this learned expert, be within the Hambrook invention.

The witness admits that the air passes freely, in a cold dry state, into the provision-chamber in the Page patent.

C. Q. 158. "Will not the cold, dry air pass down from the ice-chamber into the provision-chamber in the Page invention?

A. "Certainly."

Witness also finds the bottom of the ice-chamber, trough and deflector in the Page patent, corresponding with the Hambrook.

C. Q. 160. "Is not the partition L a full mechanical equivalent of the ice-bottom of defendant's refrigerator?

A. "Considered separately and alone, it is."

C. Q. 161. "Is not the deflector plate in the Page refrigerator a full mechanical equivalent of the deflector plate in the Hambrook refrigerator?

A. "Considered separately and alone, it is."

C. Q. 162. "Is not the function of the deflector plate in the Page refrigerator the same as the function of the deflector plate in the Hambrook refrigerator?

A. "It is.

Both of complainant's experts base the Hambrook invention entirely upon what they term, free movement of the air and the introduction of the cold air in a dry state into the provision-chamber. Witness Dayton placed more stress on the dry air theory, and witness Smith more on the free movement of the air. The theory of the invention was very lightly touched upon by the witnesses in their testimony given in making the *prima facie* case, but was made very prominent in their rebutting testimony.

Witness Dayton after admitting that in many of the old refrigerators the air would pass down in a cold state into the provision-chamber, its contact with the ice-water (almost, as he says, at a freezing point,) he thinks would render the older refrigerators inferior to the Hambrook.

He does not explain why in the Hambrook refrigerator the air which passes into the ice-chamber, around and through the ice, thence laterally under the ice-rack in contact with the water dripping from the ice-rack and deflector plate, will remain dry, while in the Law, Smith, Chase, Lyman and others, it will become wet, by no greater contact with the ice-water.

He admits that in those older devices the air passes downward into the provision-chamber in a cold state, but does not explain why cold air at the point of saturation in the Hambrook refrigerator is dry air, and cold air at the point of saturation in the Lyman device is wet air.

All the witnesses agree in this: The warm air rises from the provision-chamber loaded with moisture and is condensed and deprived of a portion of the moisture by the ice and lower

temperature of the ice-chamber. The air descends in its cold condition at the point of saturation, but never is it as cold as the ice or ice-water dripping from the ice. So the air will continue to condense and to give up its moisture until it has passed beyond contact with the ice-water. The air is called cold dry air, because cold air will not retain as much moisture as warm air; but air when it escapes from the ice-chamber is always at the point of saturation, otherwise it could not have given up any of its moisture in passing through the ice-chamber, and it can not take up moisture by coming in contact with ice-water, but if of a higher temperature than ice-water, as Dayton and Smith both admit that it always is, it must continue to part with its moisture until it reaches substantially the freezing point.

The admission which complainant's experts were compelled to make, to the effect that the air in these older refrigerators is cold air, is equivalent to the statement that it is also dry air; that is, it is in a condition not to carry large quantities of water. One of the most effective methods of removing moisture from warm humid air, is to drive it through small openings into and through ice water.

The testimony of complainant's experts shows that, notwithstanding their positive statements, they were ignorant of the laws governing condensation and movement of air currents. Smith does not know the effect of moisture on the specific gravity of air (174).

He says any reduction in the temperature of air will cause precipitation (C. Q. 46). He supposes it is possible to remove all the moisture from the air (R. 176). Says if two equal bodies of air, one cold and the one warm, and both at the saturation point, mingle together there will be no precipitation (C. Q. 25 and 52). This learned expert would make a rainstorm an impossibility, and, without reference to the amount of moisture in the air, he says contact between air and any colder solid body will always cause precipitation. He does not know which is the better conductor of heat air or water (R. 178);

nor the comparative specific gravity of air or water. He thinks the larger the flues the more rapid will be the current in those flues (R. 172). He does not think the shape of the air-opening will have any effect upon the free movement of the air (R. 177). He can not tell how much faster air will flow through an opening two inches square in a cross section than it would through two openings having the same surface in cross section.

He can not tell which construction is the worse, the Sanford or the Smith refrigerator, but he is sure that both of them are bad enough.

Neither of the experts have ever made any experiments with the Hambrook refrigerator, or with any other refrigerator, except Smith, in one single instance seems to have tested the temperature of the provision chamber in a refrigerator constructed substantially like the Fisher patent.

In view of the remarkable character of the testimony of these experts as to the effect of lengthened tubes, bent or curved tubes or air passages, and the effect of condensation, we deem it proper to cite briefly references showing the effect of condensation, the comparative freedom of the movement of the air and water, and the effect of the lengthened air passages.

Condensation depends on two conditions: 1st. The dew point of the air. 2d. Differences in temperature. Saturated air can never take moisture from a colder liquid, but is always compelled to give up its moisture when it comes in contact with a body colder than itself. Air will never give up moisture to a colder body until it has been reduced in temperature below the dew point.

The dew point is variable. The average condition of outdoor air in England is eighteen degrees removed from the dew point. In most parts of the United States it is much farther removed.

Hood on Ventilation, page 328.

The dew point varies at different seasons of the year. This is seen by the fact that in summer a vessel filled with ice water

will condense drops of water on its outer surface while in winter a vessel filled with ice water will seldom show any condensation, and never in a very dry room, even though the temperature of the room is above summer heat.

In a closed refrigerator, theoretically, there never could be any condensation in the provision-chamber after circulation begins, except from the outside air introduced through the doors of the refrigerator. The testimony of all witnesses, except complainant's experts, prove that the theory is correct.

The movements of air and water are governed by the same law, and whether the flow is upward or downward, its velocity is controlled by differences in specific gravity.

Air being lighter and more mobile than water, it flows much more freely. So much so that under the same pressure, through openings of the same dimensions, the amount of air that will pass through the opening will be 840 times greater than the amount of water. Enc. Brit., Meterology, p. 124.

In cases where the current is produced by heat or cold, the advantage is still further in favor of the air, for the reason that the heat conducting qualities of water are more than 44 times as great as the heat conducting qualities of air. Hood, 17.

If a body of air is heated, it expands and rises bodily, conveying the heat by *convection*, while if a body of water is heated, a portion of the heat is transmitted by conduction and has no effect to lift the water.

Again, if air is driven by pressure with great velocity through very large and crooked pipes or flues, considerable allowance must be made for what is termed the viscosity of the air (improperly spoken of as friction), but where the movement is comparatively slow, as in the case of the air currents in a refrigerator, and all currents caused by difference in temperature, the viscosity or friction is too small to be measured.

"All fluids are viscous. They oppose a resistance to the relative motion of their parts. This resistance diminishes with the velocity of the relative motion and becomes zero in a fluid,

the parts of which are relatively at rest. When the relative motion is small the viscosity may be neglected without introducing important errors." 12 Enc. Brit., p. 479.

"The vertical height of the column of heated air governs the velocity of the discharge in the ratio of the square root of the height of the column." Hood on Ventilation, p. 360.

"The vertical height is that alone which governs the rate of the discharge, and the horizontal tube is merely one of the fortuitous circumstances which slightly modify the result." Id., same page.

"Suppose when the difference in temperature is 8 degrees and the vertical height is 4 feet, the motive power is 32.6 grains per square inch. If the difference in temperature be increased to 16 degrees, while the height remains the same, or if the height be increased to 8 feet, while the temperature remains the same as at first, the pressure in either case will be 65.2 grains per square inch, or twice the former amount. The same rule applies to other differences, both of height and temperature." Id., p. 28.

"The increase of motive power to be obtained by increasing the height of the ascending column is therefore what must be principally depended upon when additional power is required." Id., 29.

"In all cases the rapidity of circulation is proportional to the motive power, in fact the former is the index of the latter and the measure of its amount." Id., 29.

"Now, the motive power, irrespective of retardation by friction, may be augmented, as we have already seen, either by increasing the vertical height of the pipe, or by reducing its diameter or by increasing its length." Id., 29.

In all cases the decrease of the size of the pipe increases the rapidity of the air current, unless the size is reduced to an infinitesimal point.

In ordinary water heating apparatus for dwelling houses, water is frequently carried several hundred feet in pipes not exceeding 1½ inches in diameter, and often not exceeding 1 inch,

and a single water radiator often contains 100 elbows or turns, and besides in many systems the same water current passes through many radiators. The difference in temperature of the water when it flows out of the boiler and when it returns to the boiler does not usually exceed 5 degrees and is often less than 5 degrees. In a refrigerator, according to the only test which complainant's expert ever made, the air in the provision-chamber he found to be at a temperature of 45 degrees, or 13 degrees above that of ice, and when it is considered that air flows with more than 840 times the freedom of water, what value has this expert testimony, based as it is on misconception of all recognized principles and known laws of air circulations?

The Alaska refrigerator has always been a successful and popular refrigerator, even complainant's witnesses were compelled to admit that it was outselling the New Perfection at the time they gave their testimony.

The Hambrook refrigerator as manufactured by R. T. Hambrook, and by the Booth & Osgood Manufacturing Company, was a failure. The companies failed, and complainant did not continue the manufacture of the Hambrook refrigerator, but adopted the form, with slight variations, shown in the Alaska.

No person who has ever used the Fisher, the Alaska, the Lyman, the Sanford, or the other refrigerators, was produced as a witness to testify to their defects. It remained for the complainant's experts to explain how moist, warm air would become wet by contact with ice or ice water, and to explain how a tall pipe or tube would impede, by friction, the passage of air. Now by applying their theory a tall chimney, say fifty feet high, would have less draught on account of the friction than a chimney say four feet high.

Conflict of Evidence.

The complainant's experts disagree in many particulars. (84) Expert witness Smith says he cannot tell from the Hambrook specification what supports the deflector plate K. (112)

Dayton says the deflector plate K is supported on the central partition a. (85) Smith says the Hambrook patent covers any deflector plate located beneath the ice-chamber and over the opening into the provision-chamber.

(107, 168, 211) Dayton repeatedly testifies that the location and shape of the plate K is material, the location being designated as over the central opening. (103, 108, 109) Dayton says the bottom of the ice-chamber in the Hambrook refrigerator must be a two part bottom. (289, 290) Smith says that Hambrook patent covers a single as well as a double bottom. (219) Dayton says that the deflectors e, e, are necessary elements of the Hambrook claim. (272) Smith says the deflectors e, e, are not necessary elements. (107, 168, 221) Dayton says a refrigerator with only one warm air flue would not infringe the Hambrook invention. (274, 275, 276) Smith says in substance that a refrigerator with one air flue would be an infringement. (261, 262) Witness Smith says the partition a in the Hambrook refrigerator separates the air on one side of the refrigerator from the air on the other side and produces some slight friction. (222) Dayton says that the partition has no effect whatever. (105) Dayton says the statement made in the second paragraph of the specification does not clearly and fully state the Hambrook invention. Witness Smith says that the second paragraph contains the essence of the invention, and refers to it as a clear statement thereof.

Patentable Inventions.

There is a difference between *patentable invention* and *mechanical skill*. The one can be protected by a patent; the other is common property. Mechanical skill can construct complicated machines, can adapt means to ends, can discern and choose the best material and the best mechanisms for its purposes, and can even construct mechanical devices that have never before been constructed, without rising to the plane of

patentable invention. Invention must strike out a new idea, and adapt means to carry out such new idea. The change necessary to embody such new idea may be slight; so slight that after the inventor has put it into practical form everybody is surprised at its simplicity. Such was the case with the Bell telephone. As early as 1861, a telephone was invented by Reis and perfected to an extent that it would correctly transmit musical sounds and consonant sounds. Reis was an eminent electrician, and he spent many years in experiment and careful, laborious study, yet he never reached a speaking telephone. It was well known prior to 1861, that varying pressure between two wires carrying a current of electricity produced a variable current. That the electric current could be varied by moving an armature to and from an electro magnet, and any person with a moderate degree of skill could have supported the armature of the Reis telephone upon a spring and thereby made a perfect speaking telephone. Yet it took fourteen years to discover that the addition of a spring was all that was needed to make a speaking telephone.

The Bell invention was more in the nature of *discovery* than *invention*, and such is the case with all real inventions. That is what is meant by "*the new idea*."

Every invention must be measured by the "state of the art," which includes all knowledge, as well as all machines in existence at the date of the supposed invention. The point is very clearly stated in "Merwin on Patentability of Inventions," on page 69, as follows:

"Every existing machine or contrivance of any sort has what may be called its horizon; and this horizon embraces many improvements which are not patentable, because they are but modifications of the old contrivance or of the use of the old contrivance Such improvements are referable therefore to mechanical skill. We do not get within the range of invention, as we have seen, until a new idea is struck out. If we go a step further and inquire what is a "new idea," the only answer is that it must be such as does not naturally follow from

what is already known. * * * If the improvement is such as any one instructed in the art might be expected to make, then it is not invention."

The same author further says:

"Every mind can reason, and every instructed mind can be relied upon to put two and two together in its own trade or art. This is precisely what is meant by mechanical skill or judgment. Thus, a man says, this wheel works well here, therefore it will work well in other but analogous situation. The act of inference here performed results in an improvement, but not in a patentable improvement."

The line between *patentable invention* and *mechanical skill* always exists, and a careful study of the state of the art will usually determine where the line should be drawn.

There are numerous cases defining what is not invention, and a reference to a few of such cases will be sufficient.

First, "a patentee by his claim as to what he regards as new, by necessary implication disclaims the rest as old."

Corn Planter Cases, 23 Wallace, 182, 12th paragraph of syllabus.

In the same case, on page 260, the court held reissued patent No. 1,092 invalid. The inventor sought to cover the driver's seat located in a particular position, so that his movement backward and forward would raise or lower the seeding apparatus. This court held this would not involve invention

Same case, page 232, reissued patent No. 1,094. This invention consisted in so placing a peg as to prevent the rear part of the machine from tipping back too far. It does not appear that such a construction was ever before made, yet the court held it did not involve invention.

Flood *vs.* Hicks, 2 Bliss, 169. The invention consisted in a wagon reach bent upwards sufficiently to allow the wheel to pass under. Before this patent, reaches had been curved, but not sufficiently to allow a wheel to pass under them. Patent held to be void for want of invention.

Crouch *vs.* Roemer, 103 U. S., 797. The patent was for a metal stiffening strip to a shawl-strap handle. *Held*, that it did not involve patentable invention.

Dane vs. Chicago Mfg. Co., 2 Biss. 38. *Held*, it did not require anything but mechanical skill to enlarge the base of a lamp cone until it met the globe of a lantern.

In re Greeley, 1 Holmes, 284. The invention consisted in the change in position of a button-hole in a suspender. Shepley, J., says:

"The difference between the two devices are merely structural changes. Such structural changes of form and proportion, although they improve the operation without changing the mode of operation, and produce a much better result, but one of the same kind, are only different and better forms of embodying the same idea, and illustrate the difference between the mechanical skill and inventive genius."

Burt *vs.* Every, 133 U. S. 394, the court says:

"It is well settled that not every improvement in an article is patentable. The test is that the improvement must be the product of an original conception."

Page 359: "Neither is it invention to combine old devices into a new article without producing any new mode of operation.

It is not claimed that the Hambrook invention shows any new mode of operation or contains a single new device.

The Hambrook refrigerator is not even an improvement on an old device, but is merely an old device in a slightly changed form, which form is not shown by the defendant's refrigerator.

Hill *vs.* Wooster, 132 U. S. 693 to 701. The invention involved in that suit was a "cabinet creamery." Before the supposed invention a box on legs had been used to support the milk cans. The inventor made a complete cabinet, having a closed receptacle below the milk cans which was useful as a place of storage, and also was useful in that it preserved a uniform temperature beneath the cans, which seems to have produced a useful result. The suit was brought to determine who was entitled to the patent—invention being conceded by both parties to the suit.

The Court held that the device was void of patentable invention, and quoted the following from 114 U. S., page 1–14.

"It is not enough that a thing be new, in the sense that in the shape or form in which it is produced it shall not have been before known and that it shall be useful, but it must, under the constitution and statute, amount to an invention or discovery."

The Hambrook refrigerator not only does not show invention or discovery, or new mode of operation, or new parts; it does not even have the merit of showing any substantial new shape or form.

Smith *vs.* Nichols, 21 Wallace 112, the Court says:

"The mere carrying forward of new or more extended application of the original thought and substitution of equivalents doing substantially the same thing in the same way by substantially the same means, with better results, is not such invention as will sustain a patent."

Hambrook did not even extend the original thought; did not substitute new means; did not produce a better result.

He merely constructed a refrigerator with old means, with an old result, and not useful in the sense that it was an improvement over older refrigerators.

Adams *vs.* Bellaire Stamping Co., 141 U. S., 539.

The alleged invention consisted in attaching part of a lantern to the wire guide by means of a hinge at one side and a spring or catch at the other. It seems a hinge connection was a new thing in lanterns. It also appears that the utility of the invention had been so marked that this form of lantern had practically superseded all others. Yet the Court held that it lacked patentable invention.

The court reasoned that hinges were old. Although the use of the hinge gave the lantern great value, yet it could not be considered patentable.

Complainant's experts admit that if the flat deflector or narrow piece of zinc used by the defendant was omitted, the defendant's refrigerator would not be an infringement.

The substitution of the flate piece does not add a new feature to a refrigerator, and even if it did, in view of the above decision, it would not be a patentable improvement.

The lantern patent was a much greater advance in the art than the addition of a zinc plate, to prevent condensation, would be in refrigerators, even if such plate were new in itself.

In the case of the lantern a new feature was added, to wit, a hinge; that is, a new feature as applied to lanterns.

It was claimed, and not disputed, that it had superseded all other forms of lanterns (542).

The lantern could be opened without complete detachment from the wire guard. The hinge was an integral part of the lantern and not a mere incidental feature which did not co-operate with the other parts, as is the case of the deflector K of the Hambrook patent.

In the case of the lantern the improvement was such that it had superseded all others; in the case of the Hambrook invention, the first five years of its manufacture proved a failure, and it never became extensively used. Even the complainant's refrigerator, which is copied, as we claim, from the Alaska refrigerator, has never had so large a sale as the Alaska.

Tack Co. *vs.* Three Rivers Co., 109 U. S., 117 to 121. In that case the supposed invention consisted in a staple used in attaching bails to pails. Also in the combination of the same with a convex metallic washer of a peculiar shape, a staple different from all older staples, and the utility of the combination was undisputed. The use of the washer with this staple was new. The novelty of the staple consisted merely in having its points cut so that in driving the staple into the wood they both turned in one direction instead of both turning inwardly or both turning outwardly as in case of older staples. The court was unanimous in the opinion that no invention was shown.

Day *vs.* Fair Haven, etc., R. R. Co., 49 O. G., 1346, decided November 11, 1889. This case holds that the addition of a

brace of old elements would not amount to patentable invention, and that a patentee would be limited to his claim as granted to him by the Patent Office.

Avon *vs.* The Manhattan R. R. Co., 49 O. G., 1,365, decided November 11, 1889.

The gist of the decision is stated in the syllabus.

"Although the patentee may be entitled to the merit of being the first to conceive of the convenience and utility of mechanism for accomplishing a certain purpose, his right to a patent must rest upon the novelty of the means he has contrived to carry his idea into practical operation."

"To do that which any competent mechanic familiar with devices well known in the state of the art could have done readily and successfully upon the mere suggestion of the purpose which it was desirable to effect, does not constitute invention."

See whole case:

It has been shown that there was very little for Hambrook to invent, considering the state of the art. The principle of air circulation was as perfect in the Lyman invention of 1856, as in the Hambrook patent of 1878. Every element which enters into his claim is admitted to have been old, and every element which Hambrook embodies in his claim had been used in refrigerators to perform the several functions performed by them respectively in the Hambrook patent.

It was not a new idea to make the bottom pieces in two parts and incline them towards each other. It was not a new idea to place the ice-chamber above the provision chamber, and provide an ice-rack above the bottom of the ice-chamber. It was not a new idea to provide a central opening and a deflecting plate over the opening. In fact, the Hambrook patent is devoid of a single new idea, and equally devoid of a new mode of operation. Under well settled principles of the patent law, the patent is therefore devoid of invention. We have claimed that the defendant's refrigerator is not a mechanical equivalent of the Hambrook invention, and we believe we are right in such claim.

For the sake of argument let us concede that it is the same in all its particulars as the Hambrook. Such a supposition will show the invalidity of the Hambrook patent. The defendant's refrigerator is substantially patterned after the Smith patent of No. 193,563.

In the Smith patent (see Fig. 2) we find the ice-chamber, the false bottom with the slot and turned-up edges, the two provision-chambers, the air passages, and the water-trough and pipes, all arranged and operating upon the identical principle as in defendant's refrigerator, and we even find beneath the metallic lining a wooden strip over the central opening. It is true that this wooden strip is a part of the bottom and integral with the remainder of the bottom. The metal bottom of the Smith refrigerator, according to the testimony of complainant's expert, Dayton, would be a full mechanical equivalent for the bottom in the Hambrook.

Let us concede that the wooden strip in the Smith patent is not a mechanical equivalent for the Hambrook deflector K, and supposing it should be found that the water dripped through the slot, (which it cannot) would it require any invention to put on a deflector or plate even if such a deflector had never before been used in a refrigerator? But deflectors were old in refrigerators. Page used one in his patent of March 21, 1876, in almost the identical form as is used by the defendant. Horn & Schaeffer show one in their patent filed before the Hambrook application. Stevens used deflectors in his patent No, 201,713. Lyman shows one in his patent of 1856. They are found in the Hunt refrigerator, reissue No. 4789, March 5, 1872, and in several other refrigerators offered in evidence.

The question now is, having every part of the defendant's refrigerator except the deflector plate old in refrigerators, would it require any invention to take the old Page deflector and apply it to the other old parts in the defendant's refrigerator?

Imitation.

Complainant's solicitor, in the court below, in his printed brief declares the infringement was "audacious," and proceeds to accuse defendant of making a refrigerator in imitation of the complainant's refrigerator.

There is no ground for such accusation.

Mr. Scofield was superintendent of the defendant company. He was familiar with patents, having taken out thirty patents of his own, and his company had previously been involved in patent litigation. He examined carefully many styles of refrigerators, such as the Alaska, the Leonard, the Lovell, the Fisher, the Belding, and others. He examined the patent records at Washington for the express purpose of avoiding the infringement of any patent.

He states in his testimony that his company had decided to have him examine the state of the art and the patents so that it would not become involved in litigation, and his object in making the examination was to avoid the copying of any patented refrigerator.

He purchased several refrigerators, and among others the Belding refrigerator.

In answer to cross question 30 (R. 301) he says:

"I presume this refrigerator, also the Alaska refrigerator, and any others we might have had, were partially taken to pieces, perhaps all of them. * * * They all, so far as I know, were treated alike."

The testimony previously cited shows that when Mr. Scofield visited the complainant's factory in August, 1885, Mr. Fred. E. Ranney, vice-president and general manager of complainant company, stated and reiterated to Mr. Scofield that the Belding Company were not making the Hambrook refrigerator, and were making a refrigerator substantially like the Alaska refrigerator, and that it was not patented.

Mr. Fred. E. Ranney, a stockholder and an officer of complainant company, resided at Belding. He was not called to

dispute the testimony of Mr. Scofield. If the general manager of the complainant company understood that they were not making the Hambrook refrigerator and so told Mr. Scofield, as he undoubtedly did, can the defendant be charged with wilfully infringing the Hambrook patent by making a style of refrigerator which differs from the Hambrook as much as does the complainant's?

The internal arrangement of defendant's refrigerator resembles the Alaska more than it does the Hambrook refrigerator.

The outward appearance does not resemble the complainant's refrigerator more nearly that it does several of the refrigerators, as is shown by the catalogues, and the resemblance which it has to complainant's refrigerator arises from the antique finish which complainant copied after defendant had adopted it.

The name has no resemblance to the name of complainant's refrigerator. The ornamentation on the outside of defendant's refrigerator differs from the ornamentation of complainant's refrigerator. The complainant (R. 294, 295) used cherry mouldings, stained a bright red, which distinguished its refrigerators from all others on the market.

The defendant never used cherry trimmings or anything in imitation thereof. Complainant afterwards used ash alone, finished in its natural color, so that the refrigerators of complainant resembles some of the refrigerators made by defendant.

The defendants used an antique finish from the first and for the two years preceding January, 1890, used no other style of finish on their refrigerators (R. 295), thereby distinguishing their refrigerators from complainant's refrigerators by this antique finish.

The complainant adopted the antique finish in 1889 (C. Q. 50, R. 113), thereby adopting the style of finish which defendant had been using, and then they complain that the defendant's refrigerator resembles complainant's.

The testimony not only shows that there was no fraud and no wilfull infringement on the part of the defendant, but shows

that there was no attempt to imitate in any way the complainant's refrigerators, but an attempt apparently to distinguish defendant's refrigerators from all others.

Has Complainant Acted in Good Faith.

Complainant not only threatened suits against the customers of the defendant, before and after the above entitled suit was commenced, but also sent circulars and circular letters for the express purpose of injuring and destroying the business of the defendant.

To such an extent was this carried on that the defendant applied to the court for relief and the court finding that such actions were unjust and inequitable granted an injunction enjoining the complainant from sending out such circulars and circular letters containing threats during the pendency of the suit (R. 205).

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Office Supreme Court U. S.
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IN THE

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1893.

No. 235.

The Belding Manufacturing Company,
Appellant,

vs.

The Challenge Corn Planter Company,
Appellee.

Appeal from the Circuit Court of the United States for the Western District of Michigan.

SUPPLEMENTAL BRIEF FOR APPELLANT.

TAYLOR E. BROWN,
COUNSEL FOR APPELLANT.

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At the hearing of this cause on the 31st ultimo, the default of counsel for appellee to file a brief within the time prescribed by the rules was suggested, and thereupon the court granted counsel for appellant until one week from the following Saturday, to wit: until February 10, 1894, to file a brief in reply to appellee's said brief.

There are many points set forth in appellee's brief that seem to have been inserted therein for no other purpose than to confuse the mind of the court and divert attention from the only features of the case necessary to a proper consideration of the decree of the court below and the facts upon which it was founded. Attention is called to

the fact that there is a mass of unnecessary testimony in the record relating to trivial matters which do not affect or have any substantial bearing upon the issues of the case. Counsel for appellee, Mr. Taggart, admitted as much at the hearing, when, for example, after arguing at some length upon the change of structure in the refrigerators manufactured by the appellee, and the date when such change was effected, closed his argument on this topic by saying, that "perhaps the date of the change "was immaterial." Similarly with other points.

I shall, however, briefly refer to some of the suggestions of appellee's counsel, not because I believe them to be important, but simply to point out their immateriality, inasmuch as they have been forced upon the court's attention, and because some of the citations from the record and from the authorities are neither full nor correct, and are consequently *misleading*.

I.

NO PATENT MARKS.

Beginning with page 35, an effort is made to show that the complainant (appellant) did not suppose up to December, 1885, that it was manufacturing refrigerators under the Hambrook patent, because no patent mark seems to have been placed upon the refrigerators until this date. The testimony in the record does not bear out the contention of the appellee as to the fact, but assuming the facts to be as stated in appellee's brief, what possible difference can the absence of a patent mark have upon the validity of the Hambrook patent, or upon the infringement thereof by appellee?

At most it can only affect the question of damages. The ownership of the patent is not disputed. The evidence is that $8,000 was paid for the patent (C. Q. 23; Rec., 62), and a presumption arises therefrom that the officers of the appellant company (organized to manufacture refrigerators upon this Hambrook patent, and which owned no other patent), must have understood that they were manufacturing under the one patent that the Belding Company owned.

The Revised Statutes of the United States, in force at the time and since the issue of the Hambrook patent, provides for the giving of sufficient notice to the public that the article sold is patented by marking thereon the word "patented," together with the date and year the patent was granted, and also provides what shall be the penalty, in the event of a failure in this respect, in the following language: "And in any suit for infringement "by the patentee failing to so mark, no damages shall be "recovered by the complainant except on proof that the "defendant was duly notified of the infringement, and "continued after such notice to make, use and vend the "article so patented." (R. S., Sec. 4 900, 1874.) Such notice was given to the appellee. Prior to beginning the manufacture of refrigerators, an officer of the Challenge Corn Planter Company, Mr. Schofield (who seems to have been a mechanical expert in patent matters, and to have had charge of several patent suits, and had considerable experience in examining patents—Q. 6; Rec., 294), went to Washington and spent a number of days in examining the file wrappers and contents of prior patents on refrigerators, and the models filed in connection with the applications, making an extended examination of the state of the art (Rec., bottom of page 299, and top of

page 300), and that at that time he examined the Hambrook Patent No. 204,216, upon which this suit was brought. (C. Q. 22; Rec., 300.) This was sufficient under R. S., Sec. 4.900; but the appellee had a second notice.

Complainant's Exhibit, "Complainant's Notice of In-"fringement" (Rec., 34) was a letter dated February 12, 1889, addressed to the Challenge Corn Planter Company, at Grand Haven, Michigan, notifying the latter of its infringement of the Hambrook patent, to which a reply was sent by the Challenge Corn Planter Company, dated Grand Haven, Mich., February 25, 1889, acknowledging its receipt and stating that if a suit was commenced The Challenge Corn Planter Company, "*was prepared* "*to enter a defense.*" This letter is also in evidence, identified as "Complainant's Exhibit, Defendant's Letter." (Rec., 34.) It thus appears from this record that the very terms of the statute have been complied with; that the appellee had ample actual notice of the patent to Hambrook, and also of its alleged infringement thereof. It further appears that after such notices it began and still continues to manufacture the infringing refrigerators. So that the contention of appellee, with respect to the absence of patent marks upon appellant's refrigerators prior to December, 1885, can have no possible bearing upon the case, even if it is true, which it is not.

II.

IMITATION. (Appellee's brief, pages 58, 59.)

The involved argument, attempting to show the existence of actual differences in the external appearance of appellant's and appellee's refrigerators, cannot refute or

rebut the positive testimony of the witnesses, Dayton, Smith, Belding, Nye, Stanton and Cutler. The fact is that customers were deceived and said they could not see any difference between the Challenge Corn Planter Company refrigerators, and the "Perfection" made by the Belding Company, especially when the former was offered to them at a lower price and was represented to be the same or as good as the Belding refrigerator. (Appellant's first brief, page 22.)

III.

COMPLAINANT HAS ACTED IN GOOD FAITH.

The closing paragraphs of appellee's brief require as an answer nothing further than a reference to the decree appealed from, as well as the opinion upon which it was based, wherein "it appearing to the court that the cross-"bill filed in this case was unnecessary to the relief "sought, said cross-bill was dismissed and costs allowed "complainant thereon." (Rec., 9, 10.)

IV.

MISLEADING STATEMENTS.

In the brief of counsel for appellee at page 12 is the following:

"He therefore abandoned the broad claims of his orig-"inal application and was content to receive the one spe-"cific claim which is found in the patent. He was *thus* "*compelled* (?) to disclaim the entire statement of the "nature of his invention, to recognize the state of the art "and to admit that the entire principle of his invention

" was old at the date of filing his application, thereby " limiting his claim to the specific form described. The " statement of the nature of the invention *therefore* does " not in any way assist us in the consideration of the pat- " ent, and we have nothing but the description of the " mechanical construction of the refrigerator and the " claim at the end of the description from which to deter- " mine the scope of the invention."

Attempt is here made to show that the *disclaimers* referred to were inserted in the Hambrook application *after* filing the same, and by reason of some adverse action of the Patent Office. Such was not the case. The disclaimers were a part of the application as *originally filed*—(see record, pages 312 to 318), the only amendment being that filed May 3, 1878, erasing the three original claims (which were rejected on the Bray, Turner and Chase patents), and inserting the single patented claim in lieu thereof. Therefore the statement of the nature of the invention (in the second paragraph of the Hambrook patent), as originally filed, and as patented is not inconsistent with the patented claim, as counsel for appellee urges, but, on the contrary, stands with as much force as though said disclaimers had never been filed at all. The statement is consistent with the patented claim. The action of Hambrook in the Patent Office cannot therefore, be invoked in the nature of an estoppel because appellant is not contending for any broad construction of the Hambrook claim. An examination of the file wrapper and contents of Hambrook's application simply emphasizes the *prima facia* presumption of the validity of his claim, because it clearly shows that his claims were improperly as well as unskillfully drawn, and that, directly a proper claim was submitted, the patent office granted it.

His first claim, for example, was for the combination of an ice-chamber and an ice-rack therein. There was no invention in the combination and it was rejected on Bray & Turner patents. (Rec., 316.)

The second claim was not for a thing or for a process, but for an "act." The examiner in rejecting it said: "The second claim is also bad in form, being to an act." The third claim was equally bad, and the examiner said: "The third also is informal, as it is to the combination of "the process with the apparatus." (Rec., 316.)

So a proper combination claim to the thing invented was drawn, accepted and patented. This constitutes no limitation or bar in any way. The prior art is the only limitation, as the claim is for a combination of severally old parts.

V.

NON-INFRINGEMENT.

The oral arguments of counsel for appellee developed a reliance upon but two defenses. First, lack of invention or patentable novelty in the Hambrook patent, and, second, non-infringement by the appellee, and although a third defense (that Hambrook's claim is void because it is for an aggregation of several old parts) was suggested by Mr. Stem, said defense was not seriously urged, either by him or by Mr. Taggart. In fact, the latter in his oral argument practically disclaimed this defense by his admissions as to the value and utility of the refrigerators made both by the appellee and appellant and relied in his oral argument upon the first defense above stated. He based his argument upon the anticipation by the Lyman

and Smith patents principally, while Mr. Stem insisted upon non-infringement. In considering the defense of non-infringement, the validity of the Hambrook patent was, of course, assumed, and Mr. Stem suggested two positions with regard to this defense. The first was that the Hambrook patent was limited in scope to the particular shape and configuration of each of the several elements of the combination claimed and that unless the corresponding elements or parts in the alleged infringing device have the same shape or configuration there could be no infringement. The second position was that the appellee has copied from the Smith patent, and that the differences between appellee's construction or the device of the Smith patent and the Hambrook patent are important and are sufficient to make out this defense. In other words, this second proposition is substantially to this effect: Appellee makes under the Smith patent, and as the Smith patent is different from the Hambrook patent, appellee does not infringe. The court will remember that in answer to the question of Mr. Justice Brown as to what patent the appellee was manufacturing its refrigerators under, Mr. Stem replied that the appellee did not own any patent under which it was manufacturing, but that it was making "*the same thing as the old Smith expired patent.*" Mr. Stem was in error in stating that the Smith was an expired patent, as it will not expire until July 24th of the present year.

(*a.*) *The Hambrook Claim.*

This second position of the Mr. Stem with respect to this question of infringement is inconsistent with one of the positions assumed by Mr. Taggart on the question of anticipation, the latter having insisted in his oral argu-

ment (as also do the appellee's counsel in their brief) that the Smith patent is like the Hambrook patent, and being one year earlier, anticipates it. What do counsel for appellee desire this court to understand with respect to the Smith patent? If the structure of the Smith patent does not infringe the Hambrook patent (and that is the contention of appellant) it is because of the existence of vital and material differences, which differences do not disappear but still exist when the attempt is made to have the Smith patent an anticipation of Hambrook. In other words, if Smith coming after Hambrook does not infringe, it will not anticipate if coming before. (Mr. Justice Jackson, in *Knapp* v. *Moses*, decided at present term.) The appellee cannot consistently urge both contentions. The truth of the matter is the appellee has not copied the Smith patent, but has copied the Hambrook, and the Smith patent is different from the Hambrook.

But to properly consider the defense of non-infringement I will refer in detail to the construction of appellee's refrigator and compare it with the Hambrook patented claim. Said refrigerator contains (1) the provision chambers B B, (2) the ice chamber C, (3) an ice support with the ice chamber, the full equivalent in every respect to the rack c^1, (4) two bottom pieces to the ice chamber sustaining the ice support or rack with a space between said bottom pieces forming a central opening extending transversely of the refrigerator from front to rear, which bottom pieces are the full equivalents, mechanically and in function with the combination of the "double inclined "bottom pieces X and Y provided with a central open-"ing," (5) a deflector plate interposed between the ice support and the bottom of the ice chamber, guarding the

central opening in the latter, to prevent both drip water and water of condensation from falling through the central opening in said provision chamber, which plate is the full equivalent of the "deflector plate," (6) the side passages *c c* from the provision chamber, entering the ice chamber precisely as in the patent and as called for in the claim, (7) gutters surrounding the central opening--that is along the proximate margins of the bottom pieces of the ice chamber to prevent water, whether drip water or water of condensation, that falls from the edges of the deflector plate to said bottom pieces, from passing over the edges of the latter and into the provision chamber through the central opening, and for directing said water to a suitable outlet pipe, precisely and in all respects the equivalent of "the trough *z*;" and we also find (8) the pipe z^1 or waste pipe to take the water from the gutters and convey it outside of the refrigerator.

(*b.*) *The Waste Water Pipe* z^1.

The drain-pipe z^1 is shown in the patent drawing (figure 2), as located in front of the box, and appellee's brief contrasts its location with that of the waste water pipe in appellee's refrigerator, which is at the rear, as though this was a matter of importance and material difference bearing upon the question of non-infringement. (Section 5, Appellee's brief, page 20.) By reference to the Hambrook patent, at lines 15, 16 and 17 (Rec., 320), it will be noticed that the gutters Z are connected by any suitable means with a perpendicular waste pipe z^1, "located in "*front or rear* of the refrigerator, as may be preferred." One of the differences of structure relied on by the ap-

pellee to show non-infringement is distinctly and expressly stated as a modification in the Hambrook patent, and is, therefore, not a difference at all.

(*c.*) *The Trough z.*

The "trough *z*" of the claim is repeatedly called in the body of the specification (Rec., 320–1) a gutter. A gutter, in a general sense, is a relatively narrow channel or groove along the edge of some part (which may be the eaves of a roof or perhaps the side of a roadway), for catching water and draining it in a desired direction, but it is not always in the shape of a "trough" or narrow channel. In architecture it is common to make the gutter a U-shaped affair depending below the eaves of the roof for catching the water that comes down over the eaves, and it is a matter of which the court will take judicial notice that it is a common expedient to dispense with a "depending" gutter, and in its stead use a flashing bar or part consisting simply of a piece of wood nailed near the bottom of the roof, in a substantially vertical direction, so that water running down over the shingles will butt up against this strip or vertical board and be carried off in the same manner as in the case of the depending gutter. In such case the gutter is formed of the vertical wall on one side and an angular wall on the other, the latter being the roof proper. (See Knight's Mechanical Dictionary, Fig. 2,348, page 1,044, Vol. 2, Ed. of 1882; also deposition of Dayton, Rec., near bottom page 38.)

In the refrigerator art we find the precise form of gutter shown in the Hambrook patent disclosed in the prior patent to Chase (Rec., 354), while the full equivalent thereof is shown first in the slight upward extension of the left-hand wall of the vertical conduit F of the Lyman

patent (Rec., 335), where such wall is shown above the inclined bottom of the cold-air chamber lettered E, and also in the part lettered d^1 of the Smith patent (Rec., 327). In the Smith patent (Rec., 330) it is stated near the bottom of the second paragraph, "the water caused "by this condensation and by the melting of the ice runs "into the bottom of the ice-box and is carried off by the "waste water pipe H, it *being prevented from passing* "*through the opening by its upturned edge* d^1." The function of the gutters or troughs of the Hambrook patent manifestly is to receive any water that comes upon the inclined bottom pieces X Y, and convey that water to the waste-pipe. The function of the rim to the flat bottom of the ice-box in defendant's refrigerator is precisely the same. The prior Smith patent, from which the appellee's construction is in this respect an identical copy, distinctly says that this is the purpose. It follows from the above, as well as from the affirmative evidence of complainant's expert, Dayton, (Rec., 38, 39) that the shape of the trough *z* is immaterial, and that therefore the appellee, so far as this element of the claim is concerned, is using the full and well known mechanical equivalent thereof which, under well known decisions of this court, is the same as the thing itself.

(*d.*) *Double Inclined Bottom Pieces X-Y.*

The claim calls for "double inclined bottom pieces X and Y," of which Mr. Dayton, complainant's expert, says "by the terms 'double inclined bottom pieces X and Y, "provided with a central opening guarded by deflector "plate K^1, I understand to be meant the *two* parts of what "I have called the horizontal partition which divides the "upper ice chamber from the lower provision chamber or

" chambers. By the word 'double,' I understand that " reference is had to the central division of this partition " in two parts, or in other words, that the two-part bot- " tom piece or partition is divided by a central passage; " the effect of the description being to locate the position " of this passage at the middle of the partition. I notice " further that the specification and drawings indicate an " inclination of the bottom pieces or parts of the parti- " tion towards the central opening *d*, but I do not under- " stand that it is vital to the invention that the inclination " (*which is merely for drainage purposes*) shall be in this " particular direction." (Rec., bottom of page 36.)

It is not contended that the horizontal bottom pieces of the ice chamber in appellee's refrigerator have no inclination at all, or in other words, that they are actually horizontal, for in such event both the drip water and the water of condensation would be collected and held upon the bottom pieces, and there would be no necessity for the use of the drain or waste-pipe. The fact is that the two-part bottom pieces of the horizontal partition have an inclination to the rear of the refrigerator, so that the water collected theron will flow into the drainage tube. Of this Mr. Dayton says: " This is, in my opin- " ion, a mere mechanical variation and not at all a de- " parture from the invention of the patent." (Rec., middle of page 38.)

Upon cross-examination Mr. Dayton further says (C. Q. 19): " Do you think that Mr. Hambrook, by the " use of the term 'double inclined bottom pieces X and " Y,' merely intended to locate the opening at the center " of what in your direct examination you called 'the hor- " izontal partition'?

" A. I think he meant to specify the double or duplex

"character of the bottom of the ice chamber and an in-"clination sufficient for drainage. He seems not to have "relied on these terms to indicate the location of the "opening, for in the claim he follows said term immedi-"ately by the words 'provided with a central opening.'

"C. Q. 21. Do you think it material which way the "the double bottom pieces X and Y are inclined?

"A. I do not, for the reason that the purpose of such "inclination is stated to be merely to drain off the water "therefrom, and obviously this may be done in any di-"rection with the exercise of no more than mechanical "judgment." (Rec., 88.)

The expert, Mr. Smith, takes this same view as does expert Dayton, to wit: that the inclination of the bottom pieces of X and Y of the Hambrook patent was designed to and has the effect of conducting the water to the drain pipe. "The incline, as shown in the drawings, is very "much greater than would be required, and I think is "substantially and fully identical in purpose and effect to "the incline in the refrigerator exhibits here, which, "while they have only a very slight inclination from side "to side have a very decided inclination towards the rear "where the drip pipe is located, and I am very certain "that all of the effects contemplated or possible in a "structure exactly like the drawing, is produced in the "refrigerators referred to." (Rec., 72; Q. 12.)

Appellant, therefore, contends that this element of the claim, to wit: the double inclined bottom pieces X and Y provided with a central opening, finds its full equivalent in the double horizontal bottom to the ice chamber of appellee's refrigerator, which double horizontal bottom is inclined to drain to the rear to the waste-pipe, and is

provided with a central opening, the margins of which are protected by the up-turned flange, or part of the metal lining.

(*e.*) *Ice Chamber C.*

The Hambrook claim also specifies the ice chamber C having the rack c^1, the latter being shown in the drawing, and set forth in the specification as being a movable rack or open-work platform to hold the ice, consisting of wood or "other suitable substance." The rack may rest upon the cleats in the sides of the ice chamber, "or other "suitable mode for its location may be adopted." (Rec., bottom of page 320.) It is contended by the appellee that because they do not use an ice-rack consisting of wood slats supported separately from each other upon transverse wooden cleats, that they do not have this element of the claim. The patent distinctly says, however, that the rack must be movable (by which was meant removable) for the purpose of being cleaned, and that its object was "to hold the ice." It was intended merely as a support for the ice in the ice chamber so that the ice would not rest directly upon the two bottom pieces of the ice chamber. It need not even be of wood, for it may be of "other suitable substance." It may not even rest upon the cleats because "other suitable mode for its location "may be adopted." In the absence of illustrations of the modification that Hambrook must have had in his mind, it will be presumed that any ice-rack found in the prior art that will perform the object of the ice-rack Hambrook shows, will be the mechanical equivalent of the latter's ice-rack in the claim of the Hambrook patent. Mr. Dayton says:

"I do not fail to notice that the rack for supporting the

"ice is slightly different in the said defendant's refriger-
"tor from that shown in the patent, being of corrugated
"sheet metal resting upon longitudinal bars, instead of
"'narrow strips of hard wood or other suitable sub-
"stance,' resting on similar bars as shown in the patent.
"The defendant's rack answers the same purpose as the
"complainant's not only of upholding the ice, but of admit-
"ting the air to the under side of the ice, and the differ-
"ence is, in my judgment, merely a mechanical one and
"not a departure from the invention of the patent."
(End of the first paragraph, Rec., 38.)

Mr. Dayton further says: "C. Q. 22. Is it not a fact
"that the table which supports the ice in defendant's re-
"frigerator has no opening for the passage of air or
"water? A. It has no opening through it, but the
"grooves of the corrugated plate are openings which
"give access of air to the bottom surface of the block of
"ice until the ice shall have melted away to fit and fill
"the grooves. After it has done this, the thin metal is a
"medium through which the air can transmit its heat
"readily to all parts of the under surface of such block
"of ice with substantially the same effect as it may do so
"through the openings between the wooden slats of the
"ice-rack in the patent. In other words, an ice-rack of
"wood (which is a non-conducting material) provided
"with slots between the wooden slats of the rack has, in
"my judgment, a full equivalent in the corrugated metal
"plate actually employed by complainant in their refrig-
"erator and present in Complainant's Exhibit, Defendant's
"Refrigerator." (Rec., 88.)

On page 20 of the brief for appellee, an attempt is made to make the differences between the ice support of the patent and the ice support used by the appellee ap-

pear very much greater than they are. Counsel for appellee states that defendant's refrigerator has "(6) *im-* "*perforate ice-table through which neither water nor air* "*can pass*," while the Hambrook patent calls for (6) "*open rack to let water and air pass through.*" The statement is misleading. When a cake of ice is upon the particular form of ice-rack shown in the Hambrook patent, no air can pass through that portion of the ice support that actually supports the ice, but can only pass at the sides of the ice chamber on either side of the cake of ice and through such spaces between the wooden slats as may extend at either side of the cake of ice. Similarly, spaces are left at the ends of the corrugated metal ice-table for the down passage of air by extending the wooden cleats or legs of said table beyond the side margins of the corrugated plate.

In other words, the length of the legs of the ice-table is such as to permit them to be inserted in the ice chamber from side wall to side wall, while said plate is several inches shorter in width than the length of the legs, so that air spaces are provided precisely as contemplated in the Hambrook patent when the open work ice-rack is used. There is no advantage in permitting the water that comes from the melting of the ice to fall directly through the ice support. In the Hambrook patent when an open work or slatted ice support is used, this drip water will fall upon the inclined bottom boards X and Y and be conveyed by the troughs to the waste-pipe. In the modified, but as we say, equivalent, form of ice holder used by appellee, the water from the melting ice is conveyed in the corrugations of the plate to the front and rear edges thereof, from which the water will fall upon the bottom boards and be conveyed by the inclination of

the latter to the drain-tube. And, as explained by Mr. Dayton, when this thin sheet metal corrugated plate upon which the ice rests has become, as it obviously does, as cold as the ice itself, then it becomes a ready medium through which the moving current can transmit its warm air to the ice. So that the said plate and the ice absorb the warmth from the air, thus cooling the latter and therefore the air may be said to impinge upon the under side of the ice. A thin sheet of metal interposed between the air and under side of the ice, if of a temperature warmer than the ice, would of course negative the statement that the air impinges upon the ice, but when said plate is as cold as the ice and gets its lower temperature from the ice, so that when the air impinges upon the plate in contact with the ice, the same effect is produced upon said air current as though the latter actually struck the ice, then it may be truthfully said that the construction used is one which permits the air to impinge upon the top, bottom and sides of the ice, as called for in the second paragraph of the Hambrook patent.

(*f*,) *The Partition a.*

It is claimed in the brief for appellee that the Hambrook patent calls for "a partition *a*" expressly described as extending up to the bottom of the ice chamber (Appellee's brief, page 20). This point of difference is based upon the assumption that the partition *a* shown in the drawings of the Hambrook patent is a necessary element of the claim of said patent, and further that being a necessary element the claim is limited to the precise form of partition shown in the patent, notwithstanding the fact that the claim does not mention the said partition. Foundation for this allegation of the ap-

pellee is supposed to lay in the fact that the Hambrook claim calls for "the provision chambers B B," which inferentially includes some partition to separate said chambers.

The claim must be read in the light of the specification and the art, because for example, the claim also calls for "the side passage *c*, from the provision chamber" and it also says "the trough *z*." Now it is admitted by the appellee that there must be more than one side passage if there are two provision chambers separated by a central partition so that if the first part of the claim is correct, and demands that two provision chambers be used, the subsequent part of the claim is incorrect because two side passages are not mentioned. The truth of the matter is that the claim and specification, as pointed out by the expert Smith, are inartificially drawn, but notwithstanding this fact, the claim is not obscure, and can be easily understood by reference to the specification. The word "provision chamber" is used in the singular and plural in the specification, and it is used in the singular and plural in the claim; and moreover, immediately preceding the claim is the statement "nor do I claim the "partitioning of the provision chamber into two com-"partments." The language of this disclaimer clearly indicates that Mr. Hambrook considered as the provision chamber the entire space below the ice chamber. It may be a single compartment, because he disclaims the invention of a partition in this single provision chamber, or it may be divided by a partition into two compartments. If it is a single compartment, then it is manifest that the patentee intended that the partition *a* might be removed either in whole or in part. As a matter of fact, the refrigerators constructed by Hambrook were

manufactured in both ways. Some had the double provision chamber and some had the single provision chamber. Where the double provision chamber was used the partition extended up through the opening in the bottom of the ice chamber and to the ice-rack. All that appellee has done is to follow the appellant's construction, which was to remove only the upper portion of the partition. So far as the upper part, therefore, of the double or single provision chamber is concerned, the appellee's construction is exactly like some of the refrigerators made by Hambrook when the partition was entirely removed. The distance between the top of the partition and the opening in the bottom of the ice chamber is a mere matter of arbitrary selection. It is earnestly contended on the part of the appellant that there is no foundation for the position insisted upon by appellee that the partition *a* must be read into the Hambrook claim; and on the other hand, it is insisted with equal earnestness that the Hambrook patent authorizes the removal of the partition *a* in whole or in part.

(*g.*) *The Deflector Plate.*

To further support the contention of non-infringement, the appellee calls attention to the fact that the Hambrook patent provides "(7) curved de-"flector plate to receive the water which drips "through the ice-rack and prevent the same from "dripping into the provision chamber" and says that the defendant's refrigerator does not have a curved deflector plate, but has "(7) flat strip of zinc to prevent conden-"sation on the underside of imperforate ice-table" (Appellee's brief, 20). It will first be noted that the patent claim does not use the word curved, but simply calls for

"the deflector plate K." It will be further noted that the specification does not specify the degree of curvature of the plate. It says that this is a "narrow sheet of curved "metal or other suitable substance K;" also "the curved "strip K," and finally in the claim "the deflector plate K." The Hambrook claim is not for a "curved" plate.

The deflector plate has but one function, and that function is proven or made manifest by the *location* of the plate, which is the essential thing regarding it. The plate, whether it be curved or flat, must be so located with respect to the entrance to the provision chamber, and must be so formed that it will prevent water that gets on the plate from going through said opening into the provision chamber. The first essential, therefore, is that the plate be located between the ice and the central opening in the bottom of the ice compartment. The next requisite is that the plate shall be able either by its inclination or curvature to direct the water into the troughs or gutters instead of allowing it to fall through the opening. *Where the water comes from and how the water is produced is immaterial.* Whether the water comes to the top of the deflector plate by the melting of the ice, or whether it comes to the bottom of the deflector plate by reason of condensation is equally immaterial so far as the function and purpose of the plate is concerned. In both instances the water must be directed away from the central aperture. The evidence is that the flat metal plate used by the appellee performs the function of preventing the water of condensation from falling into the provision chamber, and this was substantially stated by Mr. Taggart at the argument, and is borne out by the appellee's brief. The curved form of plate is not essential or Hambrook would have made it so in his claim.

It is true that the Hambrook patent does not specify that the curved plate K is essential to carrying off the water that collected upon it by condensation, but a patentee is not obliged to state in his specification all the uses or function of every part of his patent. The theory by which this court has decided that a double use of an old device is not patentable is substantially the same theory by which this court held in *Robert* v. *Ryer*, 91 U. S., 157, that the inventor of the machine is entitled to the benefit of all the uses to which it can be put, *no matter whether he conceived the use or not.* If, therefore, a curved plate is not claimed, although shown and described in the Hambrook patent, and if, as the evidence shows, a flat plate occupying the same position in the combination as the curved plate will carry off the water of condensation and will prevent the latter from falling through the central opening into the provision chamber, it is certain that said flat plate would also carry off the drip water if an open work ice-rack were used above it instead of a corrugated metal ice-rack. It is also evident that the particular deflector plate shown in the Hambrook patent, to wit, a curved one, in addition to directing the drip water away from the central opening, will also direct the water of condensation away from the opening, and it follows, therefore, that the flat plate is the full, complete and obvious equivalent of the curved plate, for under the decisions of this court it is immaterial whether Mr. Hambrook understood that his curved plate, in addition to carrying off the water that fell from the melting ice, would also carry off the water that collected by condensation.

It seems clear from the foregoing that every single element of the Hambrook claim finds its correspondence in the construction of appellee where all the parts, although

slightly modified in form, are arranged in the same manner, have precisely the same function and co-operate to produce precisely the same result as the several elements or parts of the Hambrook claim, and that, therefore, appellee's construction is an infringement of the Hambrook patent if the latter is valid.

VI.

DECISIONS ON THE LYMAN AND SANFORD PATENTS.

On pages 2 to 6 inclusive, counsel for appellee has referred to numerous decisions in which the Lyman and Sanford patents were concerned, ostensibly for the purpose of determining the construction to be placed upon these two patents by this court in an attempt to have the said patents anticipate the Hambrook, but in reality for the purpose of using the prior *refrigerators* mentioned in said decisions as cases of prior invention and use. For example, at the top of page 6, of said brief, reference is made to a dozen closed refrigerators made between the years 1852 and 1855, the description of said refrigerators being quite meager.

While it is undoubtedly true that this court will take judicial knowledge of the decision of an inferior federal court where the text of the decision is undisputed, as by certified copy or the like, it is not true that this court will take such judicial notice of the construction of a prior structure incidentally mentioned in such decisions as will enable the court to compare said structure with a subsequently granted patent and hold the latter to be invalid. That would amount to a case of *prior use which must be pleaded specifically.* The alleged prior structures must

be introduced in evidence or their absence properly accounted for, and a full opportunity must be given to the patentee to examine the same evidence by which the defendant undertakes to defeat his patent.

Any statements, therefore, made in said prior decisions cited by counsel for appellee, which might at first appear to describe that which could be considered as the Hambrook invention should not be considered in this court at all, because not properly raised in the court below. To now consider such prior structures *sua sponte*, as it were, would be doing violence to the long established and settled principles of equity jurisprudence.

Assuming, however, for the sake of argument only, that no technical objection can stand to the consideration of the facts disclosed in said prior decisions, I will now refer to them because it will appear from an examination thereof that the contention of appellee is not correct, and that his inferences can not be deduced therefrom. It will further appear that he has not properly quoted the text of the decisions in his brief.

And first as to the Lyman patent decisions, five in number, all of which were in the Circuit court, counsel for appellee does not quote the last of said decisions, *i. e.*, the case of the *Lyman Ventilating and Refrigerating Co.* v. *Chamberlin*, decided in 1876 and reported 10 O. G., 588, (also 2 Bann. & Arden, 433).

Judge SHEPLEY says in that case that the claims of the Lyman patent have been repeatedly the subject of judicial consideration and that "as the same construction has "been substantially repeated in the Circuit court in the "Northern, Southern and Eastern Districts of New York, "in the Second Judicial Circuit, I adopt that construction

" as the law of this case. The invention of Lyman, *as*
" *thus construed*, consists in a combination of a proper
" reservoir holding the cooling material in an elevated
" position so as to create the required circulation, with a
" conduit or conducting structure which will surround the
" cooling material or the cooled air, or both, and give to
" the cooled air its downward motion, in a determined
" direction, in its application to a room in which this res-
" ervoir and conduit are elevated, or in relation to which
" they hold this elevated position for the purposes of
" cooling, purifying and ventilation. There must be a
" reservoir for the cooling material open at or near the
" top for the current of lighter and warm air to come in
" contact with the cooling material and thus become con-
" densed and by its greater specific gravity to fall through
" the cooling material downward to and over the floor of
" the room, and in so doing displace the lighter and warm
" air, forcing it upward toward the top of the compart-
" ment to be again, by contact with the ice in the reser-
" voir, condensed, precipitating its moisture and again
" falling by specific gravity downward, thus keeping up
" a continual circulation; *and there must be something*
" *which will answer the requirement of the patent as a*
" *'descending conduit' to give to the current of cooled air*
" *a determined downward direction.*"

I think there can be no doubt but that this construction of the Lyman patent is correct, and that it is in harmony with the decision of this court in *Roberts* v. *Ryer*, 91 U. S., 150, where the Lyman patent was held to anticipate the Sanford. In both cases the object of the partition was to separate the cooling material and the volume of cold air from that part of the ice-box where the warm air should ascend. In both cases there was an opening at the top of

the partition to allow the warm air to flow into the ice compartment, and there was an opening in the bottom of the partition to allow the cold air to escape from its down flue or conduit into the opposite side of the refrigerator. The purpose was precisely the same, although the shape of the two partitions was different. This court said: "there was therefore in this invention of Lyman the "open ice-box, and the partition open above and below, "dividing the refrigerator into two apartments, in one of "which the air passed down only, and in the other up- "ward only. * * * True, the partition was not ver- "tical, and the apartments need not be of equal or of any "particular proportionate size. Neither was this necessary, "as has been seen in the Sanford patent. Each, how- "ever, called for the circulation of air, and each obtained "it substantially by the same device. They each passed "the cooled air in the ice-box through convenient open- "ings downward in one apartment and upwards through "the other. In each device the cooled air passed through "the opening *in the bottom of the partition*, and the warm "air *through that in the top*." (91 U. S., 156, 157.)

VII.

THE LYMAN AND SANFORD PATENTS.

Having seen, therefore, that both the Lyman and the Sanford patents must have a chamber, apartment, conduit or flue into which the cooled air from the ice compartment is forced or can descend, and which conduit is separated from a second conduit by a partition; having seen that there must be an opening in the bottom of this partition no matter what the length of the partition may be, so

that said descending current or volume of cold air shall pass into the lower part of the second compartment; and having seen that the partition must also have an opening at its top whereby the warm air will be allowed to return to the ice compartment, it seems clear and beyond dispute that neither the Lyman nor the Sanford patent can be considered in any manner as anticipating the totally different structure of the Hambrook patent.

In the Lyman and in the Sanford patent, as Judge Shepley has said, "there must be something which will "answer the requirement of the patent as a descending "conduit." And upon turning to the Hambrook patent no such "something," no such "descending conduit" can be found. The cold air from the ice compartment does not descend into one of two compartments separated by a substantially vertical partition and is not conducted from the bottom of one compartment into the bottom of the other. On the contrary, the cold air descends directly into the provision chamber B, in Hambrook's patent. Moreover, by an examination of Figure 2 of the Hambrook patent it will be found that the cold air descends from the ice-chamber simultaneously into both provision compartments B B, and in appellee's construction the central partition *a* facilitates this direction of movement because it is not extended up into the ice-chamber as is the partition *a* of the patent. There is nothing like this in either Lyman or Sandford.

At the hearing counsel for appellee contended that if the modification suggested by the Hambrook patent be followed out and the partition *a* be extended upward vertically through the ice-chamber until it meets the lid D that we would then have in each half of the Hambrook device the precise thing of the Lyman patent. (And in

looking at Figure 2 of the Hambrook patent the court will not be confused by the irregular lines marked *ss*, as these lines only indicate a shallow, narrow water pan that may or may not be used, and when present only extends a few inches into the interior from the front of the ice-box. Hambrook specification near top of page 321, record.) Such one-half of the Hambrook refrigerator as modified would not constitute the Lyman patent for the very simple reason, if for no other, that it has no partition substantially vertical that can answer to the "requirement of the patent as a descending current," as Judge Shepley puts it, and would have no construction where "the cooled air passed through the opening in the "bottom of the partition and the warm air through that "in the top," which Mr. Chief Justice WAITE stated was a necessary feature of the Lyman device. (91 U. S., 156.)

Even if the one-half of the Hambrook refrigerator as thus modified could, by any possibility of legal contortion, be twisted into being the same thing as the Lyman invention, the latter would only be held to anticipate *that modified form*, and not to anticipate the invention as claimed. It will be remembered that Hambrook *does not claim* such modification, but only suggests it. His claim is for a combination that makes a complete unitary structure, and such a claim cannot be defeated by showing how closely Lyman approximated to one-half of the structure claimed. The claim must not be met piecemeal, but in its entirety. *Imhaeuser* v. *Buerk*, 101 U. S., 647.

In this connection appellant calls attention to and requests the court to carefully consider that part of the deposition of the expert witness Dayton, relating to the

Lyman invention, beginning with the last paragraph on page 128 of the record, and ending with the first paragraph on page 131 of the record.

From the above it is confidently asserted that the court will have no difficulty in reaching the conclusion insisted upon by appellant, to the effect that neither the Sanford nor the Lyman patent contemplated the complete and unitary device shown in the Hambrook patent, and that neither shows the combination of Hambrook's patented claim. There are no double inclined bottom pieces; there is no waste water-pipe; there are not two troughs or gutters; there is no deflector plate; there is no central opening in the bottom of the ice compartment through which the cold air from the latter can pass into the provision chamber or chambers at the closest point; and there are not two side up-take flues for directing the warm air from the provision chambers, taking it at the warmest parts thereof; and there is no provision made for directing the cold air into the provision chamber or chambers without material hindrance. A water-soaked wooden cleat for supporting one end of the wooden ice-slats and which incidentally happens in the drawing of the Lyman patent to be illustrated as extending almost over the top of the conduit F can not be considered in any sense as being the deflector plate contemplated by the Hambrook patent. This contention is borne out when we consider the Sanford device, for in the Sanford patent (Rec., 331) the right-hand provision compartment or down-take cold air or conduit which this court held to be equivalent to the narrow conduit F of Lyman, has no deflector-plate guarding its opening, and there is absolutely nothing to prevent both the drip water and the water of condensation from falling directly down upon the

provisions in said cold air compartment or conduit. And if the left-hand wall or partition of the conduit F of the Lyman patent be extended half again as far to the left as it now appears in the drawing, and which is warranted by the decision of this court, and the statements of the patent specification, there is no warrant for assuming that the wooden cleat for supporting the upper end of the ice-table would also be widened and extended so as to cover the upper part of this conduit. It therefore seems clear that the wooden cleat, which readily becomes soaked with water and permits water to drop down into the conduit F, does not answer the purpose of Hambrook's deflector-plate, but on the contrary it is manifest that it was never intended by Lyman for any similar purpose.

VIII.

The Smith Patent.

I now pass to the construction of the alleged anticipating Smith patent. (Rec., 327.) It is admitted on the part of the appellant that the Smith patent shows the provision chambers B B of Hambrook, the ice-chamber C of Hambrook, an ice-table or rack equivalent to the rack c^1 of Hambrook, the equivalent of the double-inclined bottom pieces X Y of Hambrook provided with a central opening, that it has also the equivalents of the troughs or gutters *z* of Hambrook, and that it has the waste-water pipe z^1 of Hambrook. It is contended that it does not show the side passages *c c* of Hambrook or their equivalents, and that it does not have the deflector-plate K of the Hambrook or its equivalent, both of which missing elements of the combination are material to the combination.

It has been repeatedly held by this court that where a combination claim is granted, in view of the state of the prior art, every element thereof is material and the patentee will not be allowed to hold as an infringer one who uses a combination consisting of less than the total number of elements of his combination. Upon the other hand, it is also well settled that in comparing such a claim with a prior device the latter will not be held to be an anticipation of the claim unless it also includes all of the elements of the combination. (*Parks* v. *Booth*, 102 U. S., 96.) It is, therefore, maintained that the Smith patent, omitting two essential and important elements of the Hambrook claim, to wit: the side passages *c*, *c*, and the deflector plate K, does not illustrate and set forth the complete combination of Hambrook. Moreover, the Smith patent shows no substitution for the deflector plate K. The ice support in the Smith patent is what is called in the patent a "false bottom." It is made of wood and is covered on its top with a sheet of zinc, as shown. The openings *e*, e^1, permit the drip water from the ice to fall through them, and if the ice melts with sufficient rapidity the water may fall directly upon the top lining of the bottom D^1 of the ice compartment and be carried off ultimately through the waste pipe H. If, on the other hand, the melting of the ice is relatively slow the water will trickle down the innermost margins or sides of the openings $e\,e^1$ and will adhere to and be conveyed along the under surface of said false bottom I. When heavy these drops of water will fall upon the metal lining of the bottom of the ice compartment D^1, but if not heavy they will be carried along by the current of cold air that passes through the space between the false bottom and the

bottom D^1, as indicated by the arrows, until said drops of water meet each other at a point centrally of the false bottom I and immediately over the central opening *d* into and through which the water will drop directly into the provision chambers E E^1. The false bottom I being of wood becomes water-soaked and full of moisture, and the water of condensation that will gather at that portion thereof immediately above the opening *d* will of course drop through said opening. Upon the whole the Smith patent not only fails to show any deflector plate but it fails to show any substitute therefor, and it fails to show an appreciation of the necessity for using a deflector plate because it discloses a construction that insures the presence of all the defects which a deflector plate obviates.

The side up-take flues F F^1 of the Smith patent cannot be considered in any sense the equivalents of the return flues *c* of the Hambrook patent, because they each open into the ends of a horizontal flue in the lid of the ice-box. The Smith patent lays great strees upon this connecting air passage in the cover or lid, because it has a central opening in the top of the lid through which it is supposed that the air current will discharge centrally upon the cake of ice.

Moreover it will not do for the appellee to suggest that these differences are not material. The evidence of appellant's experts, Smith (Rec., 169) and Dayton (Rec., 135), is positive and direct to the contrary.

IX.

THE LAW OF THE STRUCTURE OF THE SMITH PATENT.

Neither will it do for appellee to suggest that the Smith patent may be altered into the Hambrook construction with the exercise of nothing more than mechanical skill. It will not do to say that the up-take flues, F F1, shall be directed into the ice-box, as in the Hambrook, by cutting a hole into the upper part of the side walls, *a a1*, that the horizontal air flue through the lid may be dispensed with and that a deflecting plate such as is found in the prior art may be nailed to the under side of the false bottom I over the central opening. Such a change would effect a complete change from the structure of the Smith patent as contemplated by him. It would not be the Smith patent but the Hambrook patent. It would be doing precisely what this court has said should not be done, in considering an anticipating device. It would be changing the law of the structure of the Smith patent, it would be doing that which Smith never conceived could be done. The law is well settled in the case of *Clough* v. *Gilbert & Barker Co.*, 106 U. S., 166, where the patent was on a gas-burner, the base of which was provided with small holes or passages, and which burner was surrounded by a tube open at the top but closed at the bottom and united to the burner below the perforations in the burner tube. As a convenient method of attaching the outer tube it was united to the burner by screw-threads.

To regulate the escape of gas through the perforations at the base of the burner tube a sliding valve was used, the same consisting of a tube adapted to be moved vertically to open or enlarge the said openings or perfora-

tions. The Barker device alleged to anticipate the Clough patent had a burner perforated at the base, but the perforations did not consist of small holes, as in Clough's burner, but were made by slitting the stem of the burner all the way down to its base, thus allowing the gas to escape through the whole length of the slit. The exterior of the burner was cone-shaped, and when the surrounding tube was screwed up so as to be in a certain position with reference to the cone, the effect was to direct to the tip of the burner a supply of gas coming through the slit below, the amount being regulated by opening or closing the slit.

In the court below, Mr. Justice Blatchford held that when the surrounding tube of the Barker burner was raised the slits would be opened and an additional supply of gas passed out of the top of the surrounding tube and mingled with the gas which escaped from the burner tip; that by screwing down the surrounding tube so that it would impinge sufficiently against the cone, the slit would be closed; that the effect of the operation of thus raising and lowering the surrounding tube was to increase or diminish the supply of gas; that the surrounding tube, considered in connection with the cone, operated as a tube or valve that could be screwed up or down to open the holes in Clough's burner more or less, as desired, to control the flow of gas, and that therefore the structure and mode of operation of the Barker burner was the same as that of Clough.

In this court Mr. Justice BLATCHFORD, himself, delivered the unanimous opinion of the court reversing his decision in the court below, stating, after discussing the facts: "The testimony as to any additional or supplementary "supply of gas in the Horace R. Barker burner amounts

"to really only this, that if that burner is *used now* in a "way in which it *was never designed to be used*, and is "not shown to have ever been used, before Clough's in- "vention, it may be made to furnish a supplementary "supply of gas. Its structure was such that to give *full* "*effect to its mode* of operation the surrounding tube did "*not require* ever to be raised so high as not to be in "contact with the cone. As it was raised from its lowest "position the slit opened and when the slit was opened to "its full extent, the tube was still in contact with the cone "and there was no orifice between them. Any further "raising of the tube *was accidental and not a part of the* "*law of the structure.* * * * Any raising of the tube "necessarily high, so as to admit the flow of gas through "an orifice between the tube and the cone to the flame, "cannot be regarded as amounting to an invention of what "Clough invented. *The structure was not designed for the* "*same purpose as Clough's;* no person looking at it or "using it would understand that it was to be used in the "way Clough's is used, and it is not shown to have been "really used and separated in that way." (106 U. S., 175.)

Applying the principle of this decision to the prior patents, it seems clear that neither the Smith nor the Lyman nor any other prior patent was designed for the same purpose and to accomplish the same result as the Hambrook. It seems certain that no person looking at it or using it would understand that it could be used in the way Hambrook's refrigerator is used, or that it could be altered to operate as Hambrook's operated, and, moreover, it is not shown in the evidence that any of these prior devices were ever used in the way Hambrook's refrigerator is used. That is to say, there is no

allegation of or testimony concerning a prior use of the invention of the Hambrook patent. In *Clough* v. *Barker*, the Barker burner *did not require any alteration* to do precisely the same work as the Clough burner. It simply required the raising of the tube a little higher, but the court said that this raising was "accidental and not a "part of the law of the structure" of the Barker burner. I, therefore, maintain that the dispensing with the horizontal flue in the lid of the Smith refrigerator and the cutting of an opening in the top of the two side walls *a a*[1] of the Smith patent and the placing of a deflector plate under the false bottom I, would not be obvious changes, but that, on the other hand, would be such changes as would bring the changed construction outside of the law of the structure of the Smith patent, and within the application of the settled rule of *Clough* v. *Barker*, *supra*.

X.

PRIOR PATENTS.

On pages 7 to 11 of the brief for the appellee, the Lyman, the Chase, the Rohrer, the Hunt, the Law, the Fisher, and the Smith patents are *each stated* to be the full and complete anticipation of the Hambrook patent. It seems that appellee's brief goes too far in this contention. If each of these seven patents completely anticipates Hambrook, they must each contain the eight elements of the Hambrook claim, arranged to operate in the same way as in the Hambrook patent, and therefore each of these patents must be identical with the other in accordance with the well known axiom that "things equal to the "same thing are equal to each other." Is it to be held by this court that the Patent Office has improvidently

granted all of these patents, including the Hambrook, which bears date later than that of Lyman? The proposition seems absurd on its face. Moreover, this court has held repeatedly, and it is an elementary principle in the construction of patent law, that a patent having been granted by the officers of the government charged with the duty of examining new inventions and issuing patents therefor, is *prima facie* evidence of its novelty and validity, and it, therefore, follows that a subsequent patent is also *prima facie* evidence of a difference between it and a preceding patent. The various differences between the prior patents set up in the case at bar will disclose themselves to the mind of any intelligent reader upon a mere inspection of the several patents, although in the first brief, I have briefly described the patents and pointed out their characteristics, and beg leave herein to refer only to the deposition of appellant's expert witnesses Smith and Dayton to corroborate the views there expressed.

XI.

THE EQUITIES WITH APPELLANT.

It is insisted that the decree of the court below should be reversed, not only for the above stated reasons, but also because all the equities of the case are overwhelmingly in favor of the appellant. It purchased the patent for some $8,000, and at once embarked in the business of manufacturing refrigerators thereunder. It considered the patent to be a contract between the government of the United States on the one hand, and Mr. Hambrook on the other, granting to Hambrook and his assigns the exclusive monopoly of making, using and vending the

patented invention for the term of seventeen years from the date of the grant. Upon the faith of this contract, it invested $25,000, and has since continued to invest other sums of money, until at the time of the closing of proofs upwards of $175,000 were so invested, and it is not improper to state that to-day the investment amounts to over a quarter of a million dollars. At large expense, it has built up its trade upon the assumption that the Hambrook patent would afford to it ample protection in its vested rights. It found, however, that the appellee appeared upon the scene, and, *without having any patent*, began to manufacture, not an equivalent device, nor any of the constructions of the prior act, but the identical structure which appellant had expended such large sums of money in introducing to the public. Moreover, the appellee, by reason of such similarity or identity of structure, was enabled to more easily compete with the appellant, especially when it reduced its price below that at which appellant's refrigerators had theretofore been sold. It witnessed, not the accidental infringement of its patent by the appellee, but a deliberate and premeditated appropriation of the Hambrook invention. Its interior construction was not only used but its exterior construction imitated, and the unlawful appropriation by the appellee extended to the copying of appellant's early catalogues, even to the copying of typographical and other errors therein. These catalogue exhibits are attached to the transcript filed. (Rec., 10.) That appellant undertook to stop this infringement by beginning suit against the appellee as well as several of its customers is no act of bad faith on the part of the appellant, as suggested by counsel for appellee (appellee's brief, page 60), but was simply and purely an attempt to defend its

rights. The appellee is in no position to invoke the equitable consideration of this court. "He that seeks equity "must do equity" is a well established maxim of law, and it is insisted that the act of the appellee in deliberately pirating the Hambrook invention can afford no pretext for invoking the aid of this court in its behalf.

A liberal interpretation of the patent law is invoked in this case, therefore. If any doubt, as to appellant's rights herein should arise, that doubt should be resolved in favor of the patent, not only upon the general principles frequently enunciated by this court (*Coffin* v. *Ogden*, 18 Wall., 120; *Smith* v. *Vulcanite Co.*, 93 U. S., 487; *Lehnbeuter* v. *Holthouse*, 105 U. S., 94, and *Cantwell* v. *Wallick*, 117 U. S., 689), but because also of the general equities of the case. In construing the Hambrook patent in view of the prior art, liberality rather than strictness should prevail, not only in view of the rules of construction laid down by this court in the numerous decisions cited on pages 31 and 32 of the first brief, but because it is a fundamental doctrine of construction that wherever a statute, contract, act or other thing is interposed to cut off existing or vested rights strictness of construction must prevail. It is upon this principle that a person charged with a crime is presumed to be innocent until the contrary is proven, and that the proof of guilt must be beyond all reasonable doubt. In fact, this court has said, "the law "requires no conjecture, but certainty" (*Coffin* v. *Ogden*, *supra*), and Judge Coxe, one of the most skillful administrators of patent law upon the federal bench, in speaking of the character of proof required to defeat a patent, says that it must be "as explicit and convincing as that "required to convict a person charged with a crime, "proof which preponderates the complainant's testimony

"not only, but which satisfies the mind beyond reasonable doubt." (*Cluett* v. *Claflin*, 30 Fed. Rep., 921.) And in another case this court has said that the evidence "must be cogent and satisfactory, and clearly made out." (*Marsh* v. *Seymour*, 97 U. S., 348.)

Can it be said that the Lyman patent, the Sanford, the Smith, or any of the prior patents, leaves no doubt in the mind of the court but that the several devices shown in each are the same devices shown and claimed in the Hambrook patent? Is the proof cogent and satisfactory? Is it convincing beyond every reasonable doubt? Is it of such character as would convict a person charged with a crime? Can it be said, for example, that, knowing what the Lyman patent was, Smith used a horizontal warm air passage in the lid of a refrigerator because he thought it was the equivalent of Lyman? On the contrary, is it not a fact that he considered that very feature an improvement, and went to the Patent Office and obtained a patent therefor? This fact is *prima facie* evidence, as heretofore stated, of material differences of construction between the Smith and the Hambrook.

XII.

DOES THE HAMBROOK PATENT EXHIBIT INVENTION?

To put the facts of this case in a light most favorable to appellee's contention, the proposition is, does it involve the exercise of invention to make the following changes in the Smith device, which is held by the court below, and is insisted by counsel for appellee to be the best reference to the Hambrook invention: 1. To insert a deflecting plate (to carry off both the water of condensation and the drip water) between the ice support and the

central opening in the bottom of the ice-chamber. 2. To dispense with the horizontal warm air flue in the lid of the Smith refrigerator, (which is a necessary feature of construction thereof), and 3. To open the two side warm air flues into the ice-chamber by making apertures in the vertical side walls *a a*[1]. In view of the prior state of the art, is it the exercise of patentable invention to thus change the law of the structure of the Smith device, or is it simply mechanical skill? Now that these changes have been made they seem very simple ones, and it is admitted that any mechanic could do the work *if told to do so by the inventor*. It is in the nature of a discovery to *appreciate* the defects of well known mechanical features, and to *determine* upon other well known mechanical features necessary to be employed to remedy these defects. As appellees state in their brief, the change necessary to embody the new idea, or invention, may be slight, "so slight that after the inventor "has put it into practical form everybody is sur- "prised at its simplicity." Such slight changes have been recognized by this court, as before stated, as determinative of the question of invention, and have been followed by the courts below. Witness the language of Mr. Justice BROWN, sitting in the Circuit court, Eastern District of Michigan:

"Now, while he seems to have made but a trivial de- "parture from the Steel patent, a departure so slight as "to raise in my mind a doubt as to its involving an exer- "cise of the inventive faculty, yet I feel that this is a "proper case for the application of the rule laid down in "the Supreme court in the case of *Smith* v. *Vulcanite* "*Co.*, 93 U. S., 495, that when the other facts in the case "leave the question of invention in doubt, the fact that

"the device has gone into general use and has displaced "other devices which had been previously employed for "analogous uses, is sufficient to turn the scale in favor of "the existence of invention." (*Consolidated Brake Shoe Co.* v. *Detroit Spring & Steel Co.*, 47 Fed. Rep., 894.)

In this same case, Mr. Justice BROWN quoted from Webster on Patents, page 30, as follows: "Where utility "is proved to exist in any degree, a sufficiency of inven- "tion to support the patent must be presumed." Utility is admitted in this case.

As an instructive example of the construction of the various decisions of this court, on the question of sufficiency of invention, by the subordinate Federal courts the decision of his Honor Judge COXE, in the Southern district of New York, in a recent case, is here briefly quoted from as follows:

"It is said that what Miller did was a simple change "within the sphere of the skilled mechanic. Simple it "undoubtedly was, but the idea never occurred to any "of the myriad of mechanics and inventors who, for "many years, have made the improvement of cable rail- "ways their distinctive work. The idea underlying most "of the great inventions is a simple one. Such an idea "came to the Cornish boy who was employed to manip- "ulate the valves of the old Newcomen steam engine. "One day, anxious to join his comrades at their sports, "it occurred to him that the walking beam vibrating "above his head could be made to do his work. Once con- "ceived, it was the easiest of tasks to carry out the idea. "An ordinary mechanic could have done it; and yet the "embodiment of that idea gave to the world the first "automatic steam-engine. So, too, the central ideas "underlying the safety lamp, the sewing machine, and

" even the telephone, are exceedingly simple. A school-
" boy can understand them now, but their authors were
" peerless inventors nevertheless, and an argument to
" prove the contrary would hardly be listened to with
" patience. Miller stands upon a distinctly higher plane
" than many inventors whose patents have recently been
" sustained by the Supreme court. In *Topliff* v. *Topliff*,
" 145 U. S., 156, 12 Sup. Ct. Rep., 825, patents were
" upheld for improvements in connected carriage springs,
" by means of which the springs move in unison, so that
" the weight imposed upon them is equalized and side
" motion to the body of the vehicle is prevented. The
" prior art approximated much nearer to the patented
" structures than in the case at bar. In *Krementz* v. *S.*
" *Cottle Co.*, 13 Sup. Ct. Rep., 719, the court held that
" it involved invention to construct a hollow collar button
" out of a single continuous plate of sheet metal, and in
" the Barbed Wire case, 143 U. S., 275, 12 Sup. Ct. Rep.,
" 443, that it involved invention to produce a coiled barb
" in combination with a twisted wire by which it was
" clamped and held in position, although plain and twisted
" wire provided with sharp thorns or barbs were known
" before. See also, *Gandy* v. *Belting Co.*, 143 U. S., 587,
" 12 Sup. Ct. Rep., 598; *Magowan* v. *Belting Co.*, 141
" U. S., 332, 12 Sup. Ct. Rep., 71; *Electric Co.* v. *La*
" *Rue*, 139 U. S., 601, 11 Sup. Ct. Rep., 670. It is
" thought, therefore, that Miller is clearly within the rule
" laid down in *Loom Co.* v. *Higgins*, 105 U. S., 580. He
" has made a new combination and arrangement of
" known elements, and produced a new and beneficial
" result never attained before." (*American Cable Ry. Co.* v. *Mayor of New York*, 56 Fed. Rep., 150.)

In this case the invention sustained by Judge Coxe was

for a combination of two carrying pulleys pivotally mounted or hinged in the underground conduit of a cable railway, and connected together by a chain or rod to insure of their being raised simultaneously in order that a section of the cable which traveled over both pulleys might be simultaneously raised and that the raised portion would thus be horizontal so as to be the more readily grasped or taken up by the gripping device of the car. In prior structures the cable, being raised by a single pulley, fell away in angular sections from either side of the pulley and could be engaged by the gripper at one point only.

It is insisted that the prior art approximated much nearer the patented structure in this railway cable case and in various cases decided by this court than does the prior art approximate the Hambrook. If it involved invention to construct a hollow collar button out of a continuous plate of sheet metal, (as this court has held in *Krementz* v. *S. Cottle Co.*); if it involved invention to connect the springs of a vehicle so that they would move in unison and thus prevent side motion to the body of the vehicle while at the same time equalizing the weight thereon, (as this court has held in *Topliff* v. *Topliff*); if it involved invention to add a barb of coiled wire to a twisted wire in such manner that the barb was clamped and held in position, when prior to that time both plain and twisted wires were old, and twisted wires had been provided with metal barbs and plain wires had been provided with coiled barbs (as this court held in the Barbed Wire cases); if it involved invention to add a backing of vulcanized India rubber to a previously old construction of piston packing, when before that the same piston packing had been provided with a rubber core (as

this court has held in *Magowan* v. *New York Belting & Packing Co.*, 141 U. S., 332); if it involved invention to add a torsional spring to the armature lever of a telegraph receiving instrument (as this court held in *Western Electric Co.* v. *LaRue*, 139 U. S., 601); if it involved invention to omit the muller stones used for breaking flax-seed and in increasing the strength of the rollers remaining, thus constituting a new process by the use of old instrumentalities (as this court held in *Lawler* v. *Hamilton*, 8 Sup. Ct. Rep., 344); and if it involved invention to apply mechanical skill to an old machine and changed its character so as to increase its utility whereby fifty yards per day of the same carpet theretofore produced could be made upon said machine instead of forty yards per day (as this court has held in *Loom Co.* v. *Higgins*, 105 U. S., 580), then, surely, it involved invention on the part of Mr. Hambrook to first recognize the difficulties in the prior constructions and to intelligently select and arrange the various features of construction employed in his refrigerator.

The combination made by him produced a practical domestic refrigerator wherein, 1st. A direct, complete and more perfect circulation of air was produced, 2d. Wherein a lower temperature of air was attained, 3d. A more perfect refrigeration and preservation of the food products placed within the refrigerator was had, wherein 4th. Whereby the consumption of ice was reduced to the minimum quantity, the same being less than that previously used in other devices, 5th. Whereby the dryness of the provision chamber was affected, 6th. Whereby foul odors, either in the ice or provision compartments were eradicated, 7th. Whereby water of condensation, or drip-water, was so caught

and conveyed away as to prevent the wooden parts of the refrigerator from becoming water-soaked, foul, musty and strong smelling, 8th. Whereby the original flavor of fruits, vegetables and other food products were preserved, and, 9th, whereby a cheap, durable and satisfactory portable refrigerator could be constructed.

Bearing in mind the fact that this court has said, in *McClain* v. *Ortmayer*, that to say that invention "involves an operation of the intellect, is a product of intuition, or of something akin to genius as distinguished "from mere mechanical skill, draws one somewhat nearer "to an appreciation of the true distinction, but it does not "adequately express the idea," and that "the truth is, the "word 'invention' cannot be defined in such manner as to "afford any substantial aid in determining whether a particular device involves an exercise of the inventive faculty "or not," the whole question seems to be, not as contended for in appellee's brief, pages 50 to 56, inclusive, but whether or not the changes that are conceded to have been made by Mr. Hambrook over and above what is shown in the prior art produce new and beneficial results. It is contended that such is the fact, and that this case comes squarely within the various authorities hereinbefore referred to, and particularly within the rule laid down in *Parks* v. *Booth*, 102 U. S., 96, and *Loom Co.* v. *Higgins*, 105 U. S., 580.

Bearing in mind the strong equities of the case, the vested interests of the appellant acquired in good faith upon this government contract, bearing in mind the deliberate piracy by the appellee, and the fact that it is manfacturing under no patent whatever, bearing in mind the ample testimony as to the practical advantages secured by the use of Hambrook's combination, bearing in mind

the fact that no forced construction of Hambrook's claim is required because every element is present in the appellee's device, it is contended that a due regard for the substantial and practical administration of justice must compel this court to uphold the patent for the combination set forth in the claim, and to reverse the decision of the court below, with instructions to award an injunction and refer the case to a master to be proceeded with according to the usual course of equity.

I cannot close this supplemental brief without thanking the court for the privilege granted of allowing me to file a supplemental brief, and without apologizing for the somewhat extended discussion of the facts and principles referred to therein. Such discussion, however, seems to be demanded in view of the large interests of the appellant here involved, and the earnest desire of counsel to secure a proper decision of the case.

Respectfully submitted.

TAYLOR E. BROWN,
Counsel for Appellant.

CHICAGO, February 7, 1894.